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No. 13

THE COMING SEASON OF LAKE NAVIGATION.

It is more than probable that before the present week is at an end a very large amount of soft coal to be moved to ports at the head of Lake Superior will have been covered by lake freight contracts at 35 cents a ton, the same rate that prevailed last year. Negotiations on the subject of coal freights have, in fact, progressed so far that the 35-cent rate is a certainty. Further progress has also been made during the past few days towards a general settlement of labor questions, notably an agreement between the firemen and several of the leading steamship companies. It is confidently expected also that within the next few days the managers of ore and coal docks at Lake Erie ports will have entered into the usual agreements with labor employed on these docks. Negotiations between these two interests have been long drawn out, but an agreement is nevertheless expected by both sides. In the matter of vessel insurance some business has been closed and there is no reason to look for delay on that score.

It would therefore seem that the situation is in all respects, save that of contract ore freights, favorable to a general rush of business as soon as weather conditions will permit. On the subject of ore freights, however, the leading owners of vessels that are operated independent of shipping interests say that their position is still as it has been for several months past. They say they are unable to locate among the so-called individual owners any ore contracts at less than 80 cents, and they are therefore still holding for that figure.

Representatives of the various companies that engage in the hull insurance business of the lakes are to meet in Buffalo this week to make up a tariff. It is expected that policies will be practically the same as last year, but that there will be some reduction in rates, on account of a lower market on steel vessels already existing in London. It is said that brokers operating in London have covered within the past week a business on steel vessels, mostly at $4\frac{1}{4}$ per cent., amounting in premiums to about \$450,000. It would not be surprising to see quite a struggle for insurance business this year.

IMPORTANT AVERAGE ORE RATE.

From the several iron ore concerns engaged in shipping ore from Duluth and other ports at the head of Lake Superior the Marine Review has received figures showing number of tons moved and average rate in 1901. From these reports the average rate on all ore moved from the head of the lakes last year (13,663,481 gross-tons) is found to be 79.9907 cents. It is probably surprising that the average rate is a small fraction below the contract rate of 80 cents, but the explanation is found in a large amount of ore that was moved on long-time contracts at rates considerably below 80 cents, as against a small amount of "wild" ore moved late in the season at rates up to \$1.25. The following table shows the average rate (tonnage average) for nine years past:

AVERAGE RATE (TONNAGE AVERAGE) ON ALL IRON ORE MOVED FROM DULUTH AND OTHER PORTS AT THE HEAD OF LAKE SUPERIOR.

Year.	Average rate, cents.	Year.	Average rate, cents.
1901	79.99	1896	97.7
1900	120.7	1895	85.9
1899	79.4	1894	78.9
1898	59.0	1893	94.1
1897	63.8		

TRIAL OF THE PACIFIC MAIL LINER KOREA.

Newport News, Va., March 26.—The new Pacific Mail line steamship Korea has been given a twenty-eight hour trial with highly gratifying results. The big ship made 20 knots under forced draft. The speed required is 18 knots. The engines developed about 18,000 H.P. readily. The machinery worked very smoothly and there was not a break or a hitch from the time the vessel left here at 6:30 o'clock Thursday morning until her return to the ship yard at 10:30 o'clock Friday morning. It had been intended to keep the vessel out about forty-eight hours, but the two runs to sea for a considerable distance resulted so satisfactorily that it was not regarded necessary to make a third run. Among those aboard during the cruise were R. P. Schwerin, vice-president and general manager of the Pacific Mail Steamship Co.; General Superintendent Walter A. Post of the Newport News Ship Building & Dry Dock Co.; James Rowbottom, superintendent of machinery; C. F. Bailey, chief engineer, and W. C. Foley, assistant superintendent of hull construction, all of the ship yard; Capt. Richard Inch, government inspector of machinery at Newport News; G. H. Ferguson, inspector for the Pacific Mail line; Assistant Naval Constructor Ferguson; Lieut. Mallory, U. S. N., and Henri Wilkinson, surveyor of the Bureau Veritas.

The cruiser Olympia, which coaled here this week, has sailed for the West Indies to join the North Atlantic squadron. The cruiser Cincinnati, now coaling off the city, will sail the latter part of the week for Charleston. The cruiser San Francisco will sail on Saturday for the European station, her first stop being at Gibraltar. The training ship Essex has arrived at Yorktown after a six-months' cruise, and will come to Old Point Saturday. The training ships Buffalo and Monongahela are expected in Hampton Roads next week.

George W. Lauder's handsome schooner yacht Endymion, which was dismantled in the recent heavy gale off Hatteras, is at the ship yard for repairs.

The Old Dominion Steamship Co. has decided to name its new \$600,000 liner, building here, Monroe, continuing its policy of naming its ships after Virginians and Virginia places.

PENSIONS FOR LIFE SAVERS.

THE FATE OF THE LIFE-SAVING CREW OF THE MONOMOY STATION HAS REVIVED THE SUBJECT—IN MEMORY OF W. H. MACK.

Surfman Ellis, the only survivor of the Monomoy life-saving crew which attempted the rescue of William H. Mack of Cleveland and others who were on the barge Wadena, stranded on the Shovelful shoal, Cape Cod, has been appointed acting captain of the new crew. Several movements have been started in the east to raise money for the widows and children of the drowned life savers. They have met with considerable success, and on Monday of this week had raised \$25,000. Undoubtedly this sum will be added to, as some theatrical entertainments are contemplated for the benefit of the bereaved. In addition the law now in operation provides for two years' pay for the widows and dependents of live savers who may lose their lives in the performance of their duty. Representative Greene of Massachusetts has introduced a bill in the house to pension officers and men of the life-saving service and their widows and children. Senator Hoar has introduced a similar bill in the senate and it is probable that at the expiration of the two years, during which the pay of the men who lost their lives will be continued to their widows and children, congress will have enacted a measure granting pensions to all classes of officers and men in the service and to their dependents. In this connection the following letter, which Capt. J. J. H. Brown of Buffalo has written to his friend, President Livingstone of the Lake Carriers' Association, is timely:

"You have doubtless noticed in the papers the loss, early this week, of the life-saving crew and others off Cape Cod coast, among the lost being our young friend William H. Mack of Cleveland. You did not do much to immortalize your name during your first term as president of the Lake Carriers' Association; that is, you did not do great things; but the opportunity is offered you now to make a reputation for yourself that will last as long as Abraham Lincoln's does. From time to time efforts have been made to provide pensions for the widows and orphans of those who lost their lives in the discharge of their duty and also pensions for disability incurred in the service and by old age. It seems to me that the Lake Carriers' Association, through its president, might write the members of congress from the lake district, and if the work were undertaken promptly, such a bill might be put through. One argument that suggests itself is that the government very properly provides pensions for soldiers and sailors who are hired to kill through love of their country, and nobody questions the propriety of it; therefore, I think that employes of the government who are especially employed to save lives at the risk of their own are also worthy of pension."

It would be well for the members of the Lake Carriers' Association to take a personal interest in Representative Greene's bill and exert their influence towards its passage.

The Lake Carriers' Association has taken suitable action upon the death of Mr. Mack, as the following testimonial, prepared by a committee consisting of Messrs. John Mitchell, W. D. Becker and James Corrigan, will show:

"At a meeting to take action upon the death of William H. Mack, held at the office of James Corrigan, in the Perry-Payne building on March 22, 1902, after suitable remarks, the following was unanimously adopted as the expression by his associates of their appreciation of Mr. Mack and regret at his untimely death:

"The startling information that William H. Mack had met death at the wreck of the schooner Wadena on the Massachusetts coast came with a shock to this community. He was active, energetic and straightforward, and, though yet a young man, had begun to make his impress on the business of the great lakes, and there had already opened up before him a life of influence and usefulness. We had confidence in his integrity and judgment, and his marked helpfulness and ready sympathy, coupled with unusual energy, made him a valued and trusted friend whose untimely loss we sincerely mourn. To his widowed mother, whose only son he was, and to his sister, we extend our deepest sympathy in their irreparable loss. May they be comforted beyond any earthly power to assuage so great a grief as theirs, and be it

"Resolved, that we adopt the foregoing expression of our sense of loss and of our sympathy with the mother and sister, and that the same be spread upon the minutes and that the secretary forward a copy to his mother."

What is said to be the greatest cargo of armor ever shipped from Homestead, Pa., left that place Tuesday night en route for New York, where it will be hurried to Europe by fast steamers. The shipment, which is for the Russian government, consisted of thirty-six plates for the first-class battleships Bordina and Ariel, now building in the imperial yards at St. Petersburg, Russia. In addition to these plates there were thirty-six tons of taper plates. The whole lot took up eighteen cars and represented six months work at the armor plate department.

Some time ago the United States circuit court of appeals at Cincinnati decided that the Chase Machine Co. of Cleveland, in making a towing machine, did not infringe upon patent rights pertaining to the well-known machine made by the American Ship Windlass Co. of Providence, R. I. The same court has now granted a rehearing in the case and has fixed April 18 as the date for argument on the rehearing, so that its decision is suspended pending the rehearing.

Scott's Coast Pilot for 1902, the seventh edition, is out. The Marine Review has them for sale at \$1.50 each.

FLOATING DOCK FOR BERMUDA.

A COMPLETE DESCRIPTION OF THE GREAT STRUCTURE WHICH THE BRITISH ADMIRALTY WILL INSTALL ON THE ISLAND.

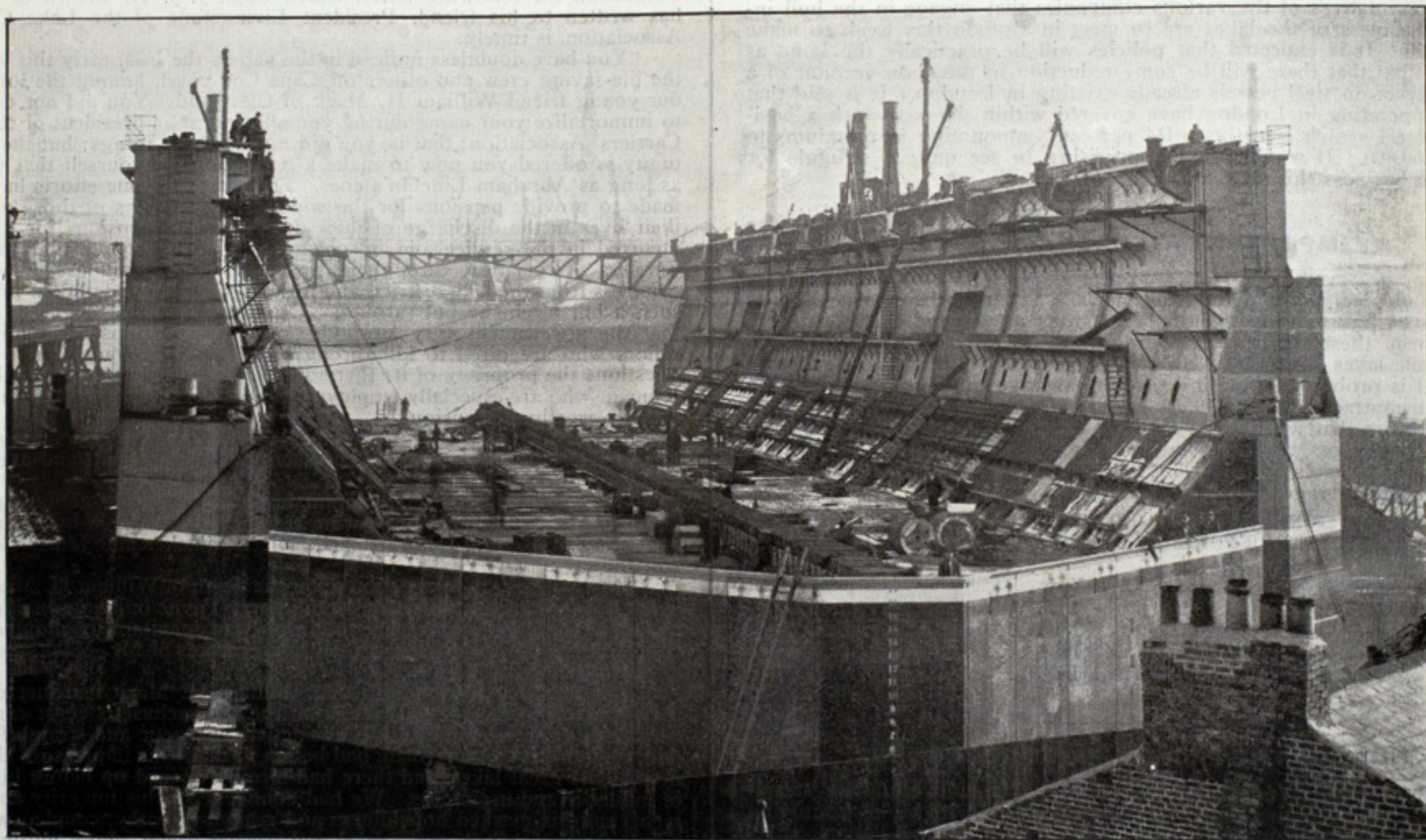
The Review recently published a brief description of the new floating dry dock for Bermuda, but now, through the courtesy of the builders, Messrs. Swan & Hunter, Ltd., Wallsend-on-Tyne, it is enabled to print a far more satisfactory one, illustrated. This new dock, which has been built to the order of the British admiralty, will replace the old floating dry dock that has been stationed at Bermuda since 1869. The old dock is obsolete now, not through age, but through the insufficiency of its dimensions. It is interesting to make a comparison between the dimensions of the old and the present docks, for they show very clearly the great increase that there has been in the size of ships since the old dock was built. The old dock, like the new, was designed with a view of accommodating the largest vessels, then built or building. The length of the old dock was 381 ft. over all, but to obtain its maximum lifting power, gates were fitted which reduced its practical length to 330 ft. Its inside width was 84 ft. between side-walls, and its lifting power was 8,000 tons, which was sufficient for the British ships of the Bellerophon class, to lift which it was specially designed, although it was capable of bringing the keel out of the water of vessels up to 10,200 tons, the then heaviest ships represented by the long fully-rigged line-of-battle ships Agincourt and Minotaur. The present dock is 545 ft. long, and having no gates, the length of the ship it can take is not restricted; its clear width of entrance between rubbing fenders is 100 ft. Its lifting power up to the pontoon deck level is 15,500 tons, but by utilizing the shallow pound this can be increased to 17,500 tons, and the walls are of sufficient height to allow of a vessel drawing 32 ft. to be taken on 3.6-ft. keel blocks.

The present dock is of the type known as a floating graving dock, the invention of Messrs. Clark & Standfield, from whose plans it was built.

toon, which is 300 ft. long, is rectangular in shape, but the two terminal pontoons, 120 ft. long, have each only 71 ft. of that length rectangular in shape, the remainder being finished off in the form of a blunt-nosed point or bow. The sides of the rectangular portion of all the pontoons are built up so as to form a broad altar standing 12 ft. above the deck.

The side walls which come each side of the pontoons, to which they are attached by double fish plates and tapered pins, taking on to the steel lugs built into the structure both of the wall and pontoon (thus enabling any of the pontoons to be disconnected for the purpose of self-docking) are rectangular structures 435 ft. long by 53.3 ft., etc., high. From their base up to the altar level their width is 13.2 ft., but from here they batter back to the engine deck where their width is 9.1 ft. Where the boilers occur, however, this engine deck is built out at the back to form a chamber 12.6 ft. wide. The walls are pierced with two gangway openings admitting light and air into the interior, and the upper portions or towers are cut down at each end, leaving a flat on which the bollards are placed and the swing bridges, which give access from the top of one wall to that of the other. The ends of the side walls are bevelled off from the back to the same line as that of the pointed portion of the pontoons, thus forming a continuous bow line for the purposes of facilitating the towing.

Pontoons of the dock are divided into forty pumping divisions, of which thirty-two are absolutely water-tight and distinct. The side walls have each eight water-tight divisions. All these fifty-six divisions are provided with a separate pipe, each governed by a separate valve. All the pipes in the starboard half of the dock are led directly into the main drain in the starboard wall, and those on the port side into the port wall. These drains are continuous over the whole length of the walls, and the four 18-in. centrifugal pumps in each wall are seated directly on them, so that any one pump can empty all the compartments of its half of dock. Furthermore, the central bulkhead dividing the dock into the two halves is not entirely water-tight, but small drainage or leakage holes are left in it, so that even in the event of a complete break-down of the whole of the plant, the other half could still slowly empty the whole dock.



THE NEW FLOATING DRY DOCK FOR BERMUDA.
Built by Swan & Hunter, Ltd., Wallsend-on-Tyne.

This type, of which many examples already exist, notably the large 18,000-ton dock for the United States navy at Algiers, which has just successfully lifted the battleship Illinois, was specially introduced by that firm with a view of producing a structure having a large amount of longitudinal rigidity. The necessity for such rigidity will be apparent when the different types of vessel that the present dock will be called on to lift are remembered. Primarily, it has to lift the line-of-battle ships of 15,000 tons displacement with a length of bearing keel of 343 ft., but in addition it has to deal with cruisers of the Terrible class, of about the same displacement but with 383 ft. of bearing keel, and lastly, auxiliary cruisers like the Campania, weighing some 17,000 tons, with a bearing length of keel of 502 ft. It is evident, therefore, that great longitudinal strength is necessary, since whilst the dock has to be long enough to deal with the 600 ft. Campania, practically the whole displacement of the 545 ft., long pontoons have to be utilized to lift a vessel bearing only on some 384 ft. of their length. Apart from this, the fact that the dock in its voyage to Bermuda may have to encounter the long rollers of the Atlantic, also makes it imperative that a very stiff form of structure should be employed.

Like the original Bermuda dock, the present one is a self-docking dock, that is, it can lift all parts of itself out of water, a most necessary facility in the sub-tropical sea of Bermuda. The dock itself consists of five portions, comprising three pontoons which form the main lifting portion of the dock, and two side walls, which, whilst affording a certain amount of lifting power, primarily serve to give the dock stability, and to regulate its descent when the pontoons are submerged. The center pon-

A separate condensing compound engine driving directly on the pump shaft is provided for each pump, and a separate return-tube marine boiler for each pair of engines. The steam pipes are, however, so arranged that either engine can take its steam from either boilers. Each boiler, engine, and pump is, therefore, duplicated in each wall, and further, each wall duplicates the other, so that if only the boiler, engine and pump remain available the dock can still be lifted.

Special provision has been made on the broad altars for the support of the armor belt of battleships, a stiff channel running along on top of them into which the heel of the vertical shores can be stepped, whilst similar channels along the face of the altars receive the raking shores that support the bilges, the shape of the dock at this part resembling fairly closely the stone steps or altars of an ordinary masonry dock.

The dock is provided with the usual fittings in the way of strong bollards on the low walls and timber-heads on the top deck, and for warping the vessel into place, six powerful vertical steam capstans are provided with sheaves or fairleads on the edge of the top deck. An electric light installation with its own generating plant is provided in one wall for lighting all the interior compartments of the dock, and in addition twelve arc lamps are carried on galleys on top of the towers, which light up when required the whole dock and ship, whilst further mains are led along the dock's sides, from which hand-lamps may be taken off to light up any particular spot where special work is being carried on. A very useful fitting for handling weights either on the dock or ship will be found in the traveling and swinging electric cranes which run along the whole length

of each wall. They are of five tons lifting power with a jib radius of 30 ft., and a lift of 35 ft. above the top deck. They are electrically driven by means of a separate generating plant placed in the towers, but this plant is so arranged with the electric lighting plant that they can be used alternately or together for either lighting or working the cranes. These auxiliary installations, whilst usually taking their steam from the dock's boilers, they are each provided with their own boilers, making them independent therefore of the main pumping installation.

A complete drainage service communicating with all the dock compartments, and capable of emptying them completely, is installed in each wall, and by the alteration of a coupling, this service can also be used as a washing-down service, by means of which the outside of the ships on the dock can be washed down, or their inside tanks tested with water. The bottom of the pontoon is protected by a series of bilge-keels of greenheart, as it is possible that at low water the dock may to a certain extent sit upon the rough coral bottom of the harbor where she will be moored. The top decks of the walls are planked with teak with a water-way all round, and arrangements are made in view of the scarcity of fresh water at Bermuda for catching and running into the reserve water tanks inside the wall all rain water falling on these docks.

The pumping machinery of the dock has been provided and erected by the Wallsend Slipway & Engineering Co., Ltd., the engines and pumps being by Messrs. Allen & Co. of Bedford. The electric lighting installation, the electric traveling cranes, and the generating plant for the same are made by Messrs. Clark, Chapman & Co., Ltd., who also fitted the steam capstans on the top decks. The dock will remain on the Tyne until the fittings are completed, and in the early spring she will be towed to Chatham, where her trials will take place, consisting in the lifting of a first-class line-of-battleship and the self-docking of her pontoons. After this she will start on her long voyage to Bermuda.

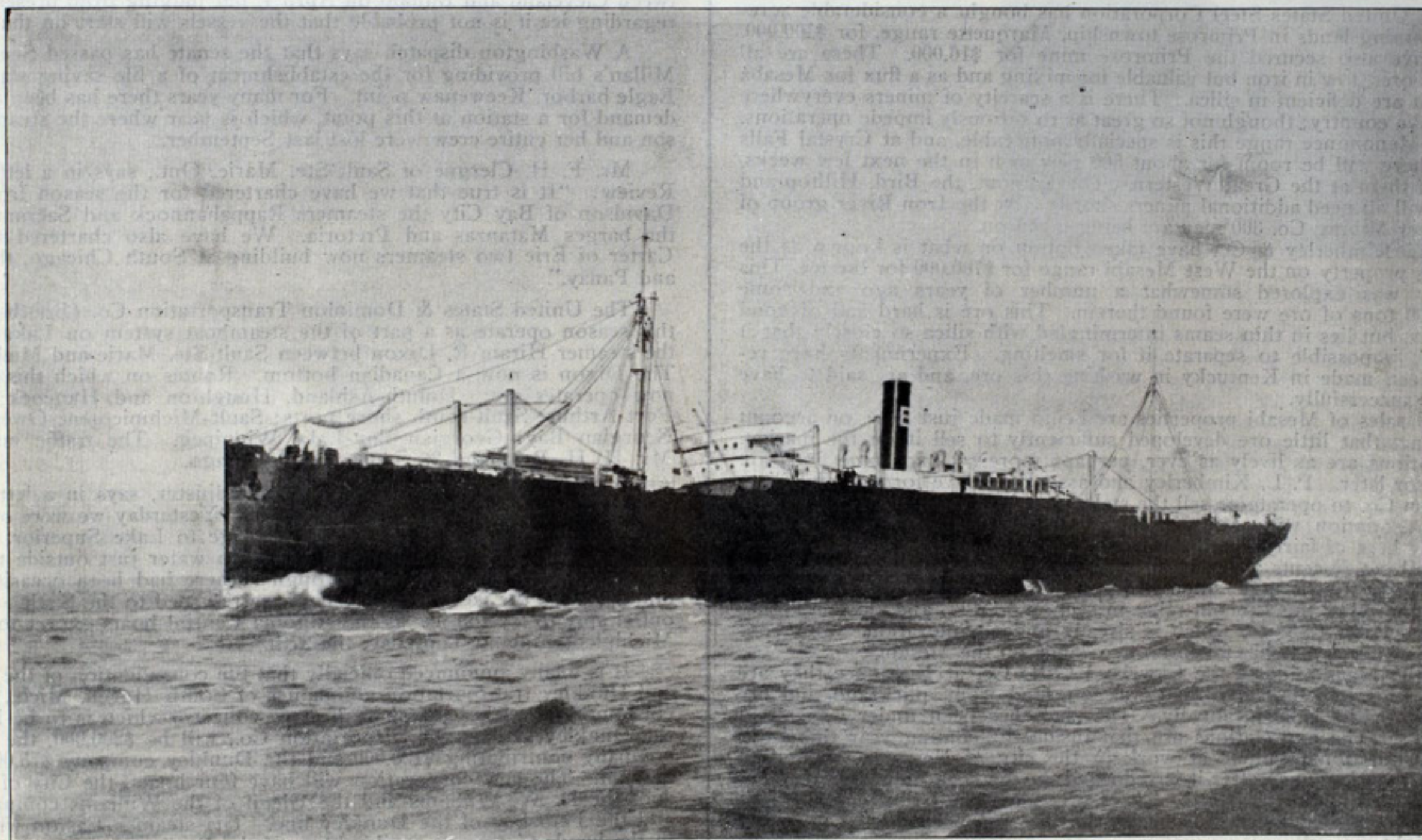
The officers' quarters are in the deck house along the engine and boiler casing, forward of which is a separate house containing the captain's saloon and spare rooms. A chart and pilot house are situated on top of the deck house. The crew is provided for under the shelter deck aft.

The vessel contains eight bulkheads, six of which are water-tight. There is a complete water bottom, divided fore-and-aft into six tanks. The fore-and-aft peaks may also be used for water ballast, and abaft the engine forward there is a deep tank which may be used for either water ballast or cargo. In all the total capacity of the tanks is about 2,800 tons. The vessel is expected to carry 10,000 tons cargo and 1,200 tons coal on a mean draught of 27.4 ft.

The machinery consists of two vertical triple-expansion engines, 22½, 39 and 63 in. diameter of cylinders with a common stroke of 45 in., designed for about 4,000 H.P. at 200 lbs. steam pressure. Steam will be supplied by four single-ended Scotch boilers, 15 ft. 6 in. diameter by 10 ft. 9 in. long, each boiler containing four 39-in. corrugated furnaces, and equipped with Howden's system of forced draft. On the trial trip, light, the Shawmut attained a speed of nearly 15 knots. She is expected to have a speed of 12½ knots loaded.

CUNARD LINE TO BUILD A FLYER.

It is quite likely; nay, it is almost certain that the Cunard Steamship Co. will go after the Atlantic record which it surrendered some time ago to the Kaiser Wilhelm der Grosse and the Deutschland. There have been numerous reports to this effect, but the Cunard company, a conservative organization, could not see the wisdom of building more expensive steamers, both to construct and to operate, than the Campania and Lucania. It built the Ivernia and Saxonia instead. These are intermediates with enormous cargo carrying capacity. It is now, however, turning its atten-



THE BOSTON STEAMSHIP CO.'S NEW STEAMER SHAWMUT ON HER TRIAL TRIP.
Built by Maryland Steel Co., Sparrow's Point, Md.

TRIAL TRIP OF THE SHAWMUT.

The Boston Steamship Co.'s new steamer Shawmut, which was launched on Dec. 21 from the yards of the Maryland Steel Co., Sparrow's Point, Md., had her official trial recently and proved herself in every way to be a staunch and economical vessel. The Shawmut has the distinction of being the largest freight steamer that has yet been built in the United States, and in point of carrying capacity will only be exceeded by the large 600-ft. vessels building at Camden, N. J., and New London, Conn. She is a monument to the courage of the Boston Steamship Co. and will unquestionably be the forerunner of a fleet of similar craft should the shipping bill pass. The Shawmut is 505 ft. long over all, 488 ft. between perpendiculars, 58 ft. molded beam and 40 ft. molded depth. The vessel is classed by the British Corporation of Glasgow and the American Lloyds. She is built under the three-deck rule with shelter deck and bridge deck on top of the shelter deck, 178 ft. long. There are nine hatches through which cargo may be loaded, and two masts together with six derrick posts, carrying twenty-eight booms to facilitate the loading and handling of the cargo. There are twelve double-cylinder winches of large size, and a Hyde windlass to operate the stockless anchors, which weigh 10,600 lbs. each. The steering is done by means of a Brown steam tiller operated by a telemotor in the pilot house, and in case of accident to the steam steering apparatus the hand wheel in the steering house aft may be used, or in case of complete breakdowns of both steam and hand gear, relieving tackle to the extended hands of the large after winch may be employed for steering.

tion to a single flyer for the high-class passenger service. Syren & Shipping says:

"The next few weeks will in all probability see the publication of the official announcement of the Cunard company that they have placed an order for a new transatlantic steamer for their New York mail route. It is well known that the plans for such a vessel have been pigeon-holed for some time past, but the high price of new tonnage has prevented the earlier placing of the order. In all probability the new Cunarder will be built on the Clyde, for, though the Tyne-built Ivernia has turned out an unqualified success, the northeast coast has yet to prove its ability to build an ocean flyer of the speed and luxurious equipment of the Campania and Lucania. Probably Lord Inverclyde will have something interesting to say on the subject at the forthcoming annual meeting. The new liner will mark a departure in Cunard practice in more ways than one. She will be a three-funnelled boat, and she will not be ordered in duplicate, as was the case with the Umbria and Etruria, Campania and Lucania, Saxonia and Ivernia. The great cost of the steamer accounts for this change of policy, for such a vessel as is proposed will run well onto, if not over three-quarters of a million sterling; and, with the possibilities of oil fuel and turbine propulsion, the directorate think it would be unwise to go in for two vessels of the size and speed of the liner determined upon. When the order is placed no time will be lost in pushing forward the completion of the boat, which, it may be confidently expected, will be a complete answer, certainly in size and luxury of accommodation, and probably in speed, to the challenge of the Hamburg-American and North German Lloyd companies."

ACTIVITY IN THE IRON MINING REGION.

A review of the situation in the iron region sent out from Duluth says that the railroads operating between mines and shipping ports undertook very early the matter of arrangements for this year's business and will be fully prepared for active operations as soon as the weather will permit. James J. Hill and associates have secured the haul of still another mine, in addition to the many they now control, so far as the haul is concerned. This is the Adams exploration, in section 27-58-20, and is shown to contain about 3,500,000 tons of good ore. It has been sold for \$125,000 bonus and a lease at 30 cents a ton royalty. The fee belongs to lumbermen and speculators who have been interested in Mesabi lands for ten or twelve years. President L. W. Hill of the Eastern Railway of Minnesota states that his road will haul to Lake Superior this year about 4,000,000 tons of ore, an increase of 1,650,000 tons over last year. The road is working day and night to complete its new shipping dock in time for early use, and will begin hauling ore at once.

Seventeen superintendents of mines operated by the United States Steel Corporation have been at Duluth lately conferring with the management of the corporation. They have been making reports as to what the mines under their control would be able to do as a steady thing or in case of emergency, what they would do as to transportation, what lake and other arrangements would be necessary for the season, and many such questions of importance connected with the 1902 operation of the shipping and mining branch. It is the policy of the corporation to get its mining managers together from time to time to consider matters of importance connected with the operation of each mine and to give each manager the benefit of the experience and work of every other man connected with the management of any of the many mines worked by the corporation. In this way there will be a system and economy of management that will be far above what has ever been known in the mining world and great results in scientific and economical operation may be looked for.

The United States Steel Corporation has bought a considerable acreage of mining lands in Primrose township, Marquette range, for \$100,000. They have also secured the Primrose mine for \$16,000. These are all silicious ores, low in iron but valuable for mixing and as a flux for Mesaba ores that are deficient in silica. There is a scarcity of miners everywhere in the lake country; though not so great as to seriously impede operations. On the Menominee range this is specially noticeable, and at Crystal Falls mines there will be room for about 500 new men in the next few weeks, many of them at the Great Western. The Lamont, the Bird, Hilltop and others will all need additional miners shortly. At the Iron River group of the Oliver Mining Co. 300 men are being taken on.

P. L. Kimberley & Co. have taken option on what is known as the Arcturas property on the West Mesabi range for \$700,000 for the fee. This property was explored somewhat a number of years ago and some 12,000,000 tons of ore were found therein. This ore is hard and of good character, but lies in thin seams intermingled with silica so closely that it has been impossible to separate it for smelting. Experiments have recently been made in Kentucky in washing this ore, and are said to have resulted successfully.

Few sales of Mesabi properties are being made just now, on account of the fact that little ore developed sufficiently to sell it on the market. Explorations are as lively as ever, perhaps more so, and some finds are looked for later. P. L. Kimberley and associates have formed the Elizabeth Iron Co. to operate or sell the state lease in section 12-57-21 recently under negotiation with Mr. Kimberley for \$225,000. There is a large ore body here of fairly good grade, for which the Minnesota state school funds will get 25 cents a ton, in all perhaps \$2,000,000. The United States Steel Corporation is understood to have taken an option on eighty acres of land adjoining the Lincoln mine in section 4-58-17, and also on eighty acres in section 12-58-18, which is already under exploration. This concern for nearly a year has taken no new lands on the Mesabi.

At the Maas mine of the Cleveland Cliffs Co. at Negaunee they are sinking with less difficulty than was expected from quicksand and are approaching the ledge gradually. The shaft has been under way about four weeks. The expectations are that inside the coming year there will be 2,000 additional miners at work in the city of Negaunee, including those at the Negaunee after it is reopened on the scale intended, those at the Maas and at the Hartford. There are other lands in Negaunee that will be explored and developed later, and the prospects of the town are very bright.

In fifteen days the Fay exploration sunk its shaft at the north Day mine, near Hibbing, a depth of 70 ft., a speed almost unparalleled. The north and south Day mines will be shippers this year of about 50,000 tons. They are independent mines, and have made sale of considerable ore on a new basis, delivered on cars at the mouth of the mine, thus giving the buyer the option of shipping down lakes for delivery anywhere he sees fit. The Day mines, however, are forced to ship to Lake Superior over the roads owned and operated by the J. J. Hill interests. Rogers, Brown & Co. have secured a large and valuable mine on the Mesabi range, and will open and operate it soon. It is located near Hibbing.

The Eleanor Iron Co., a new concern, will reopen the Appleton mine at Loretto, which has been idle for a long time. The Bird mine at Crystal Falls will be reopened at once. This mine belongs to the county of Houghton, and all money it pays goes to the county. In the old Dexter mine, on the western Marquette range, ore is being found, and there is hope that it may prove to be a large property. It has been shut down since twenty years ago. It produced in the early days a manganiferous hematite that was of value.

About 200,000 yards of earth will be stripped from over the Mahoning ore deposit. This mine is owned by several steel-making companies, including the Cambria Steel Co., the Steel Hoop Co., the Republic Iron & Steel Co., and others.

At the annual meeting of the Cunard Steamship Co., held in London this week, a dividend of 4 per cent. was declared. Twenty-five thousand pounds sterling was withdrawn from the reserve fund. The company paid 8 per cent. during 1901, 5 per cent. in 1900, 3½ per cent. in 1899 and 2½ per cent. in 1898. The decrease from last year is attributed to the decline in freights.

AROUND THE GREAT LAKES.

Belknap & Phillips of St. Clair, Mich., have purchased the steamer C. Hickox from James M. Reed of Toledo.

The Great Lakes Towing Co., which now controls practically all the harbor towing and wrecking business of the lakes, has 126 tugs.

The senate committee on commerce has authorized favorable reports on two house bills providing for the construction of marine hospitals at Buffalo and Pittsburgh.

Official announcement has been made of the appointment of Gibson L. Douglass, Jr., as agent of the Western Transit Co. at Duluth, in place of A. B. Wolvin, resigned.

L. S. Sullivan of the Toledo Harbor Tug Line has sent out a notice stating that his company will do towing and wrecking business at Toledo, Buffalo and Tonawanda this season.

One of the two large steel steamers building at the South Chicago works of the American Ship Building Co. for E. D. Carter of Erie will be launched Saturday and named Luzon. She will go into commission about April 25.

Capt. J. W. Westcott, chairman of the committee on water signals of the Lake Carriers' Association, issues notice that vessels should not load deeper than 17 ft. 5 in. at present. The water level of the Detroit river is still considerably below normal.

At Toledo, Wednesday, the Craig Ship Building Co. launched the steel steamer Redondo, built for Swain & Hoyt of San Francisco. This vessel is 200 ft. over all, 28 ft. beam and 16½ ft. depth of hold. She will start on her voyage to San Francisco about April 20.

Gen. Mngr. T. F. Newman of the Cleveland & Buffalo Transit Co. will have the large side-wheel steamers of his line ready for service between Cleveland and Buffalo on April 1, but judging from present reports regarding ice it is not probable that the vessels will start on that date.

A Washington dispatch says that the senate has passed Senator McMillan's bill providing for the establishment of a life saving station near Eagle harbor, Keewenaw point. For many years there has been an urgent demand for a station at this point, which is near where the steamer Hudson and her entire crew were lost last September.

Mr. F. H. Clergue of Sault Ste. Marie, Ont., says in a letter to the Review: "It is true that we have chartered for the season from James Davidson of Bay City the steamers Rappahannock and Sacramento and the barges Matanzas and Pretoria. We have also chartered from Mr. Carter of Erie two steamers now building at South Chicago, the Luzon and Panay."

The United States & Dominion Transportation Co. (Booth line) will this season operate as a part of the steamboat system on Lake Superior the steamer Hiram R. Dixon between Sault Ste. Marie and Michipicoten. The Dixon is now a Canadian bottom. Routes on which this company now operates are: Duluth-Ashland, Houghton and Hancock; Duluth-Port Arthur; Sault-south shore ports; Sault-Michipicoten; Owen Sound-Georgian Bay; Georgian Bay-Lake Winnipeg. The traffic manager is Mr. H. H. Brigham, 36 State street, Chicago.

Capt. George A. Simpson, compass adjuster, says in a letter to the Review under date of Monday, the 24th: "Yesterday we were out on the tug Philadelphia, trying to break a passage to Lake Superior. We got nearly out to Iroquois and could see open water just outside the point. We could have forced a way through if there had been occasion for so doing, but as the ice was rather hard we returned to the Sault. We went out simply to try the ice, as the Algoma Central boats expect to start for Michipicoten about Thursday, the 27th."

It is finally announced officially that the consolidation of the Williams and Dunkley transportation companies of South Haven, Mich., has been consummated. The capital of the new concern, which is to be known as the Dunkley-Williams Transportation Co., will be \$200,000, the Williams company contributing \$125,000 and the Dunkley company \$75,000 to this amount. The new corporation will have four boats, the City of Kalamazoo, the H. W. Williams and the Glenn of the Williams company's line and the Petoskey of the Dunkley line. The steamer Easton will remain in the hands of present stockholders of the Williams company, and is for sale. The dock property of both companies is included in the consolidation.

United States Ambassador Clayton at Mexico has transmitted to the state department a copy of a concession for the establishment of steamship service between Mexican and Asiatic ports and for the exploitation of fisheries, granted to Messrs. Tarpey and Bennett, American citizens, by the Mexican government. The concessionaires bind themselves to establish two lines of steamers—an ocean line for Asia and a coast line on the Pacific and gulf of California; to grant to the government free transportation of mails, and rebates on the fares of federal employees and on government freight. The Asiatic lines shall make at least one round trip every four months, and the coast line a round trip every two months, between such points as shall be determined by the contract, which shall be forfeited if the lines are not established within the term of two years from the promulgation of the contract. The zone conceded for the exploitation of fisheries lies in the gulf of California and neighborhood. The concessionaires bind themselves to establish at least one fish cannery within the term of two years, and for such purpose may occupy gratuitously such vacant national lands as may be necessary.

Rear Admiral M. T. Endicott, chief of the navy bureau of yards and docks, has prepared specifications providing for the towing of the Havana dry dock, recently purchased from the Spanish government, to Subig bay. The voyage will begin about May 1. The dock will be towed via Suez.

A definite campaign has been instituted in Washington to retain Rear Admiral George Wallace Melville as the head of the bureau of steam engineering. Indeed it is quite likely that the distinguished engineer will succeed himself.

THE WORLD'S GREAT FLEETS.

Tables relating to large shipping companies of the world, prepared in London from the records of Lloyd's register, show four companies—two British and two German—that own ships of greater tonnage in the aggregate than the United States Steel Corporation. The five leading companies are:

	Vessels.	Gross Tons.
Hamburg-American	134	668,000
North German Lloyd	120	556,000
Elder, Dempster & Co.	153	431,000
British India Steam Nav. Co.	122	384,000
United States Steel Corporation.....	113	343,517

The Shipping Gazette of London, discussing these tables from Lloyd's register, says:

Ocean communications become every year of greater importance to a country relying mainly upon over-sea food supplies. Our position amongst the nations of the world is inseparably linked with our naval and mercantile fleets, and upon their supremacy depends a continuance of our prosperity and power. In view, therefore, of the extreme national importance of our merchant shipping, it is not without interest to note our present resources in this respect compared with other countries, and the progress that has been made since the application of steam to navigation. In the year 1830 there were only 168 British vessels exceeding 500 tons each, and in 1834 the largest vessel classed in Lloyd's register was the ship George IV. of 1,438 tons. The first steamer entered on the register was the James Watt, 294 tons, built in 1821; and the first iron steamer to appear there was the Sirius, 180 tons, in 1837. The Great Britain, 2,084 tons, was built of iron in 1845, and first exceeded 300 ft. in length. The Great Eastern, 18,918 tons, in 1858, was 680 ft. in length, and was equipped with propeller and paddle wheels. The Britannic, which exceeded 5,000 tons, was built in 1874; and in 1888 the City of New York and her sister ship, each of which exceeded 10,000 tons, were fitted with twin screws. In 1899 the dimensions of the Great Eastern were exceeded by the Oceanic, 17,247 tons, which was 704 ft. in length. In 1901 the Celtic, 20,904 tons, made its appearance, and this vessel at present holds the record for size. In 1820 the total steam tonnage belonging to the United Kingdom was barely 8,000 tons. In 1838 the British steamers afloat numbered less than 800, and registered nearly 150,000 tons. At this period the United States owned about 5,000 tons more in steamships than Great Britain. In 1901 the United States possessed 1,036 steamers with a total gross tonnage of 1,704,156, against 12,053,394 tons, made up of 7,161 steamers belonging to the United Kingdom. The following table, compiled from Lloyd's register, June 30, 1901, gives the total merchant shipping of all countries possessing over 1,000,000 tons:

Country.	No. of vessels.	Gross tons.	Proportion of sail, about.
Great Britain and colonies.....	10,869	14,708,206	1-7
United States	3,286	3,077,344	2-5
Germany	1,786	2,905,782	1-6
Norway	2,321	1,627,220	1-2
France	1,247	1,406,883	1-4
Italy	1,213	1,117,538	2-5
Other countries	8,369	5,757,537	1-5
Total	29,091	30,600,510	

The preponderance of Great Britain is overwhelming, but other countries are now making determined efforts with the help of subsidies to reduce this lead. Nowhere is there keener rivalry than between the great steamship lines of this and other countries, but as the size and power of steamships increased the immense outlays required necessitated the formation of corporations with great strength and capital, who now control the main trade routes. Everywhere the watchword to success appears to be centralization, and the survival of the most fit ends in amalgamation. To what an extent this has been the case in shipping is shown by the following list of owners, arranged in order of tonnage owned, whose fleets, including ships building last September, aggregate not less than 100,000 tons in each case:

BRITISH.

Owners.	Gross tons.	Vessels.
Elder, Dempster & Co.....	431,000	153
British India Steam Nav. Co.....	384,000	122
P. & O. Steam Nav. Co.....	320,000	57
Leyland line	293,000	46
Union-Castle line.....	267,000	48
White Star line	250,000	26
J. R. Ellerman	217,000	69
Clan line	182,000	51
Wilson line	179,000	80
Alfred Holt	178,000	42
Atlantic Transport Co.	172,000	20
Pacific Steam Nav. Co.	156,000	40
Allan line	155,000	35
Harrison line	142,000	30
Anchor line	144,000	33
Lamport & Holt	130,000	40
Shell Trans. & Trading Co.....	124,000	37
Cunard line	120,000	18
Anglo-American Oil Co.....	105,000	34
MacLay & McIntyre	101,000	39
Prince line	101,000	40
Andrew Weir & Co.	101,000	39

FOREIGN.

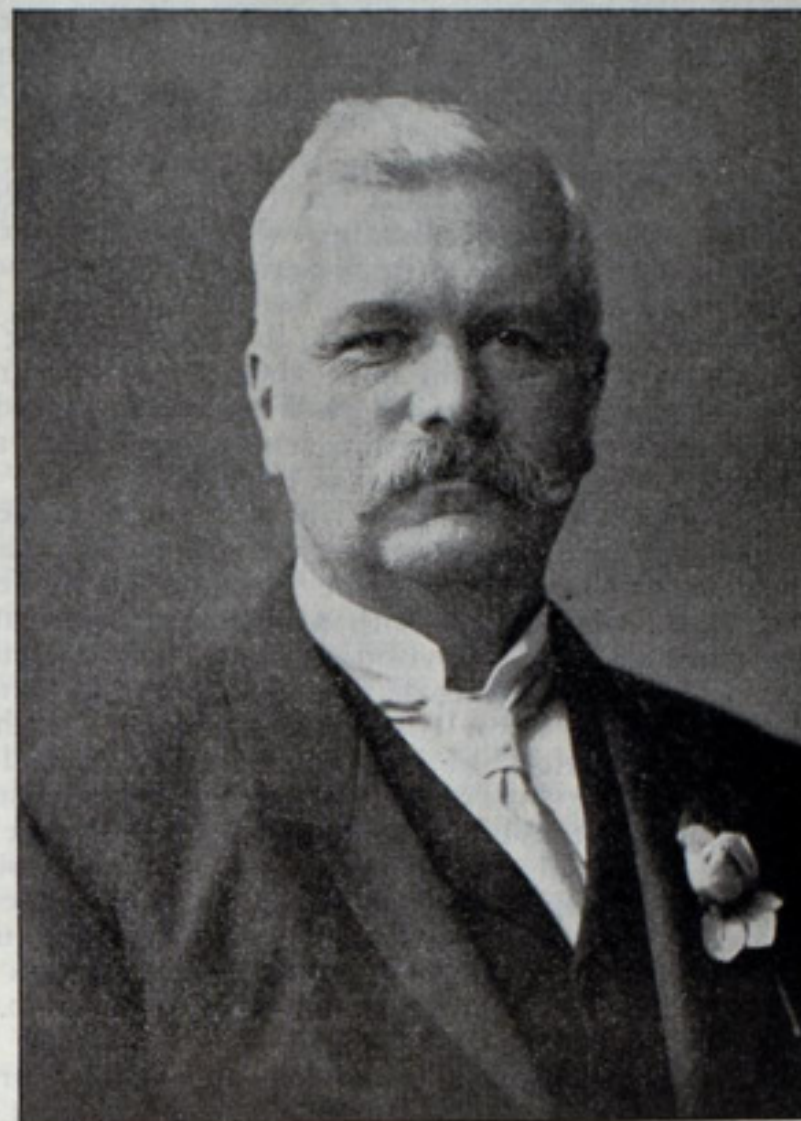
Hamburg-American Co.	668,000	134
Norddeutscher Lloyd	556,000	120
United States Steel Corporation.....	343,517	113
Messageries Maritimes	248,000	62
Nippon Yusen Kaisha	215,000	73
Navigazione Generale Italiana	205,000	103
Austrian Lloyd	186,000	69
American line	184,000	25
Compagnie Generale Transatlantique	178,000	57
Forenede Dampskib Selskab	141,000	121

Owners.	Gross tons.	Vessels.
Hamburg S. American Co.	140,000	35
Hansa Co.	120,000	37
Chargeurs Reunis	114,000	35
Deutsche Australische	110,000	25
Kosmos Co.	105,000	29
Russian Steam Navigation & Trading Co.	100,000	82

LIEUT. COL. WILLIAM PATRICK ANDERSON.

Lieut. Col. William Patrick Anderson, chief engineer of the department of marine and fisheries and general superintendent of lighthouses of the dominion government, is a gentleman with whose good works the shipping interests of the great lakes are familiar, though the great majority of the vessel men on the United States side rarely have the pleasure of meeting him.

He was born at Levis, Que., Sept. 4, 1851, and was educated at Bishop's college, Lennoxville. He married Dorothea S. Small, the eldest daughter of H. B. Small, on Oct. 18, 1876. He entered the civil service as assistant engineer of the marine department in October, 1874, and was promoted to his present position in February, 1880. In 1885 he established the Canadian Militia Gazette and edited it for two years. His duties are defined as embracing most of the technical work at departmental headquarters, including the construction and maintenance of lighthouses, lightships, fog alarms, buoys and beacons; supervision of construction and repairs to government steamers and the construction and equipment of lifeboats; the administration of the vote for the removal of wrecks and obstructions in navigable waters; tidal and current surveys; hydrographic surveys, and the publication, examination and correction of hydrographic charts; construction of and repair to fish hatcheries and refrigerators; engineering points in connection with the construction and maintenance of fish passes; supervision of surveys of oyster beds; examinations for applications for foreshore, wharf and water lots as they affect the interests of navigation; preparation and publication of notices to mariners and hydrographic notes.



LT. COL. WILLIAM P. ANDERSON.

During the twenty-two years Col. Anderson has occupied his present position he has designed and erected over 335 lighthouses and forty fog alarm installations. The following are among his best engineering works: A complete hydrographic survey of the bay of Quinte; construction of a lighthouse on a caisson foundation in 13 ft. of water on Colchester reef and another in 14 ft. of water in Pelee passage, Lake Erie, fireproof throughout; the building of a permanent lighthouse in the traverse of St. Roch in 42 ft. of water and a tideway of over 7 knots; the installation of a first-order siren, worked by compressed air, on Belle Isle, with power obtained from the lakes on the hills; and the installation of an occulting electric light and electrically-operated fog alarm on a shoal in Victoria harbor, British Columbia.

Col. Anderson is a member of council and executive committee of the Dominion Rifle Association and a well known rifle shot, having represented Canada at Bixley and having in 1900 won the governor general's match, the big prize of the dominion meeting. He is a charter member of the Canadian Society of Civil Engineers, being one of the committee to draft its constitution, and in January last was elected its vice-president. He commanded the Forty-third battalion, Ottawa and Carleton Rifles up to January, 1892, when he was placed on the retired list. He is an altogether pleasant, engaging and energetic official.

Prof. O. G. Dodge of the navy, who is superintending the rebuilding of the naval academy, has submitted a report to the navy department showing that the appropriations up to the present time amount to \$4,570,000, and that expenditures and the contract obligations up to July of this year will amount to \$2,094,934.37, leaving at the beginning of the fiscal year an unexpended balance of \$2,500,000. It is expected that during the next fiscal year the expenditures will be as high as \$3,000,000 additional. Beside giving these figures Prof. Dodge has advised the department of the various advanced degrees of progress on the numerous buildings under construction.

A 75-ton folding-jib gantry crane which the Fore River Ship & Engine Co. of Quincy, Mass., is adding to its facilities for repair work and outfitting is nearly ready at the Wellman-Seaver Engineering Co.'s shops, Cleveland, O., where it is building. The frame work, which is to rise higher than the mainmast of a warship, will carry a horizontal jib which may be raised at any angle and will be used for placing the Harveyized steel armor on battleships and cruisers, for lowering a vessel's boilers and engines into position, for stepping masts and stacks, and for similar work. It has a guaranteed capacity exceeding 75 tons. The crib work for the crane dock is being lined up with the help of a diver.

SOME NOTABLE PRODUCTS OF BRITISH SHIP YARDS.

Glasgow, March 17.—The battleship *Queen*, which was launched a few days ago by *Queen Alexandra* at Devonport dock yard, and the *Prince of Wales** which will be launched next week by the *Prince of Wales* at Chatham dock yard, are sister ships with some differences. They have also both some differences in constructive details from preceding ships of their class, though of the same dimensions, namely, 400 ft. length, breadth 75 ft., and draught at 15,000 tons displacement, 26 ft. 9 in. The earlier ships had a boat deck extending from the forward to the after bridge, 8 ft. wide inwards from the shell of the ship, but in the *Queen* and *Prince of Wales* this deck has been done away with, excepting for a short length of shelter in proximity to the bridges. There are instead bulwarks fitted with the usual partitions for stowing hammocks, according to the practice prevailing in battleships and cruisers twelve years ago. It reduces the freeboard by 4 ft. and lessens the weight of the upper structure. There are no metal cowls for ventilating the stokeholes, the idea being that in action such "upper works" when destroyed may greatly hamper the working of the ship owing to the large number of splinters that would be flying about. Wind-sails are erected when required to direct the air down the shafts communicating with the machinery compartments. The new ships also will have quick-acting hydraulic boat derricks. The boats to be carried are four launches, two of them 56 ft. in length and two 40 ft., with thirteen sail and row boats, the largest being of 42 ft. in length. The large steam launches will have a speed of 13½ knots, and will be able to discharge the smaller size of Whitehead torpedo. There will be two masts in each ship—one with a semaphore 160 ft. above the waterline, and the other arranged for wireless telegraphy.

The machinery for the *Prince of Wales* is being built by the Greenock Foundry Co. and that for the *Queen* by Harland & Wolff, Belfast. In both cases the speed is to be 18 knots when the engines are developing 15,000 H.P., maintained with a steam pressure at the engine of 250 lbs. while running at 108 revolutions per minute, equal to a piston speed of 918 ft. The two engines have each three cylinders arranged for working the steam on the triple-compound system. The high-pressure cylinder is 31½ in. in diameter, the intermediate 51½ in. and the low pressure 84 in., the stroke being 4 ft. 3 in. Piston valves are used on the high pressure and intermediate cylinders and flat valves on the third, all of them operated by the usual double eccentric and link motion. The engines have the cylinders supported in front by six forged steel columns, and at back by three cast iron frames, the latter having large surfaces as slipper guides. The bed plates, of cast iron, are arranged for six main bearings, each 21 in. long. The three-throw crank shaft is of 17 in. diameter, the propeller shaft slightly larger, and throughout there is a 9-in. hole bored in the center. The propellers, which are manganese bronze, with four blades, have a diameter of 17 ft. 6 in., with a pitch of 19 ft. The engines are made to turn inwards when going ahead, by which arrangement the chief engineer has always both engines directly under his personal control. There are two condensers for each engine, the collective surface of the coiling tubes being 16,000 sq. ft.

The *Prince of Wales* is to have twenty boilers of the Belleville type, with economizers—fifteen of them with ten elements in the generators and eight elements in the economizers and the remaining five boilers with nine elements of generating tubes and seven of economizers, that is in all 195 steam generating elements and 155 economizer elements. The total heating surface is 37,040 sq. ft. and the area of the fire grates is 1,170 sq. ft. The twenty boilers are arranged in three compartments, one having four boilers and each of the other compartments eight. There are two funnels, the forward one taking the smoke and gases from the eight forward boilers, while the other funnel is connected to the uptake from the remaining twelve boilers. There are ten steam fans in the stokehold, as well as three furnace air-pumping engines, while in the engine room there are two motor fans for ventilation. The *Queen* has Babcock & Wilcox boilers, fifteen in all, the total heating surface in their case being 34,400 sq. ft., while the grate area is 1,147 sq. ft. The machinery of the *Queen* weighs in all 1,530 tons, or 100 tons more than that of the *Prince of Wales* constructed at Greenock. In the one case 9.80 I.H.P. is generated from each ton of machinery, in the other it is 10.49 I.H.P.

The steamer *Oscar II.* which is, even while I write, making her maiden voyage across the Atlantic from Copenhagen to New York, is in many respects a noteworthy vessel, a product of the renowned yard of Alexander Stephen & Sons, Linthouse, Glasgow. She was launched in November last and is 520 ft. in length, 59 ft. in depth from keel to highest deck, and of 10,500 tons gross. Her construction was effected in nine months. She has seven complete or partial decks, of steel wood sheathed, the exposed weather deck covering being of teak. She was constructed under the rules of the Bureau Veritas to the requirements of their highest class, special survey. She has enormous strength forward (the shell plates are 1½ in. thickness and the framing in proportion) in view of the possibility of meeting ice at the European end of the Copenhagen and New York route. The bulkheads are so arranged that the vessel is practically unsinkable, and to ensure greater strength and rigidity a steel bulkhead is placed fore-and-aft at the center line. The builders have fitted two sets of triple-expansion engines, supplied with steam by nine boilers, and the engine room is admirably arranged and is most complete. The vessel has excellent accommodation for passengers. The first and second-class occupy the awning deck under the bridge, while special rooms have been built for superior first-class on the top of the bridge deck. The emigrant and third-class berths occupy the whole length of the upper 'tween decks. Accommodation is altogether provided for about 1,200 people, including 150 first-class, eighty second-class and 700 third-class passengers, and the rooms in comfort, convenience and elegance, can hardly be surpassed. The vessel is intended to carry a deadweight of 8,000 tons, and she has every possible facility for rapid handling of cargo. The *Oscar II.* belongs to the fleet of the ever-growing United Steamship Co. of Denmark. It is said that in the docks at Copenhagen every second steamer has the red and black funnel of the United Steamship Co. They are engaged in many and various trades, and the ships are of all sizes. Altogether they own some 130 to 140 steamers. Some years ago they confined themselves very much to North Europe, but lately they took over the vessels of a line engaged in the Atlantic trade, and now, the development having been successful, they are going in for larger and faster steamers, of which the

Oscar II. is the first. This means a great deal, not only to the company but to Denmark and the rest of Scandinavia. Formerly passengers from these countries for America had either to go to Germany or to Britain and re-ship, but now they can sail direct from their own country. The *Oscar II.* is double the tonnage of any of the company's other vessels, of very much larger carrying capacity, and she has four knots more speed.

Twenty-six years ago William Denny & Bros., Dumbarton, Scotland, built for the Union Steamship Co. of New Zealand the two vessels with which they began business. These were serviceable steamers of the type of their time, measuring 215 ft. in length and 27 ft. in beam. Since then Denny & Bros. have built no fewer than thirty-two vessels for this company, and have a thirty-third on the stocks. No. 32 was launched this week under the name *Aparima*, and it is significant of the progress of the company that she is fully double the length and breadth of the two pioneers from the same yard. The *Aparima* is of the shelter-deck type, and she is built to the requirements and under the survey of the British Corporation. She is principally intended for cargo, of which she is capable of carrying 8,600 tons, but accommodation has been provided for a dozen first-class passengers in large well-ventilated cabins, each cabin being arranged for only two passengers, so that there will be no overcrowding. The saloon is a large and handsome apartment, framed in polished hardwood and upholstered in velvet. The ceiling is panelled and painted in artistic tints relieved with gold. The boats are carried on a boat deck above the accommodation, which, extending right out to the ship's side, forms a promenade in good weather, while the space below it forms a sheltered promenade in wet weather. For handling the large amount of cargo carried the vessel is fitted with ten powerful steam winches, each with a derrick capable of pluming 12 ft. clear of the ship's side, so that cargo may be lifted directly from the holds into either of two lines of trucks on the wharf alongside. The upper and main decks are arranged for the carriage of horses, and special arrangements have been made for their safe transport, the ventilation being a special feature of the ship. The vessel is fitted with an electric light installation, including mast head, side signal lamps, and cargo lamps. A powerful steam steering gear by Alley & McLellan is fitted at the after end of the engine room, and controlled from a standard on the flying bridge. The bottom of the vessel is arranged for carrying water ballast, and both peaks and a deep tank amidships are arranged for holding additional water ballast. The propelling machinery by Denny & Co., Dumbarton, consists of two sets of triple-expansion engines, each having three cylinders. The valve gear is of the double eccentric type, the high-pressure slide valve of the piston pattern, the intermediate and low pressure valves double ported. The air pumps are of Edwards' patent pattern, and separate centrifugal circulating pumps are provided to each condenser. The feed arrangement consists of two feed pumps worked off the main engines, two Weir's pumps, a feed heater and a feed filter. One of Weir's distillers is also provided. The three boilers are designed for a working pressure of 180 lbs., are fitted with cockscomb furnaces, are arranged to work under Howden's system of forced draft, and have been constructed in accordance with the British Corporation requirements. The power to be developed by the machinery is to insure a speed at sea of 11 knots when the vessel is fully loaded. The *Aparima* will be employed in the Colonial and Indian service of the Union company.

A notable product of the Fairfield Ship Building & Engineering Co., Glasgow, is a twin-screw steamer named the *Panama*, which they have just launched for the Pacific Steam Navigation Co. The dimensions of this steamer are: Length 400 ft., breadth 52 ft. and depth 29 ft. The *Panama* is a first-class mail and passenger steamer, built especially for the American west coast trade. She has been constructed in accordance with the American laws and British Board of Trade, and is in excess of Lloyd's requirements. Accommodation is provided for about 130 first-class passengers and 200 steerage, with the usual complement of officers and crew. The arrangements throughout the vessel are of the highest character, the comfort of the passengers being specially considered. In addition to a handsome dining saloon, a large social hall and smoking room are provided. Arrangements are made on the main deck for the carrying of cattle and on the spar deck aft traders' stalls are fitted, necessary in the particular trade in which this steamer will be engaged. A complete installation of electric light is fitted, and also a complete refrigerating plant. The ventilating and pumping systems have been arranged to suit the special nature of the trade, and are very complete. The propelling machinery consists of two sets of triple-expansion, surface condensing engines, each set having three inverted cylinders working on three cranks. The high-pressure and intermediate-pressure cylinders are each fitted with a piston valve, and each low-pressure cylinder with a double-ported flat slide valve, all worked by the usual double-eccentric and link-motion valve gear. Each set of valve gear is controlled by an all-round steam and hand reversing engine. The crank shaft is in three pieces, each piece being built up and interchangeable. Thrust, tunnel and propeller shafts are of forged mild steel. Each propeller has three blades of bronze, the bosses being of cast steel. The engines are fitted with the latest improvements for economical working, including a feed heater and a feed filter, also a large evaporator for producing fresh water to supply the boiler. A complete system of donkey pumps is also fitted. Steam is supplied by two double-ended and two single-ended steel boilers. Each of the double-ended boilers has six furnaces and each single-ended three, making a total of eighteen furnaces. The boilers are adapted to work at a pressure of 190 lbs. All the first steamers of the Pacific Steam Navigation Co. were built at Fairfield, and now after an interval of some years the company have gone back to their original source of supply.

A new addition to the fleet of the Indo-China Steam Navigation Co. has just been provided by the London and Glasgow Engineering & Ship Building Co., at their Glasgow yard. The dimensions of the vessel are 370 ft. by 47 ft. by 30 ft., molded, and about 4,200 tons gross, and she is designed to carry 6,000 tons dead weight on 24 ft. draught of water. She is built to class 100 A1 at Lloyd's, three-deck rule under special survey, and to British Board of Trade requirements for passenger certificate, and is fitted with all the most modern appliances for quick handling of cargo, etc., including powerful steam cranes to the two midship hatches. There is a double bottom for water ballast fore-and-aft, and the peaks can also be used for trimming the ship. The saloon and first-class passengers' accommodation is in a steel house on bridge deck forward of the funnel casing, and has been specially designed with a view to meet the require-

*This battleship was launched according to program March 25.

ments of the trade for which the vessel has been built. The captain's room and chart room with navigating bridge on top are in a neat teak house over the saloon house, while the officers and engineers are housed at each side of the bridge deck. The vessel has been constructed with a view to carrying troops or native passengers. The triple-expansion engines have cylinders of 29 in., 47 in. and 76 in. diameter by 48 in. stroke, and three main boilers are fitted with Howden's system of forced draft. She was christened the *Nam Sang*, and will be employed in the cargo and passenger service between Hong Kong and Calcutta.

The boiler committee is now considering the several alternative designs for boilers submitted by the ship builders tendering for the new armored cruisers of the Devonshire class. These new cruisers are to be of 10,200 tons displacement, or 10 ft. longer than the vessels of the County class, and the engines are to indicate 22,000 I.H.P. to give a speed of 23 knots. Only 1,890 tons as a maximum can be allowed for machinery, and the several firms were asked to submit designs and prices for installations of Yarrow, Dürr, Niclausse and Babcock & Wilcox boilers, and also for certain combinations of cylindrical and water-tube boilers, embracing various systems of draft. These designs are now before the boiler committee. Some delay must be incurred in adjudicating on the combinations. There is naturally considerable discrepancy in price between the different firms. A Clyde firm quotes the Yarrow installation at £48,000 less than the Niclausse, while another Clyde firm quotes the Yarrow £5,000 higher than the Niclausse. A third firm quotes the Dürr at £10,000 less than the Yarrow, while a fourth quotes the price £32,000 higher. One firm places the ship with Babcock & Wilcox boiler £13,000 below the Yarrow, and another £24,000 above it. It will be no easy job to decide among such differences.

It was recently stated in a London paper, and again in a Liverpool paper, that the Cunard company have placed orders for one or two enormous new boats to beat everything afloat in size and speed. Doubtless this statement has been repeated on your side. It is "too previous." The facts I believe are as follows: The Fairfield company, John Brown & Co. of Clydebank, and Vickers Sons & Maxim of Barrow-in-Furness have each been asked by the Cunard company to submit designs, with the approximate cost of constructing vessels to attain a speed of 24 knots, others to run at 23 knots, and others again 18 knots. The intention is to form a definite design by assimilating the best features embodied in the plans submitted by the three firms named, and then to request the firm to submit a definite price should it be finally decided to go on with the building of vessels of one or other of the classes mentioned. The 24-knot speed will involve a power of 48,000 I.H.P., which is in excess of the power anticipated for the new ship *Kaiser Wilhelm II*. At 23 and 24 knots enormous power is of course needed to add further to the speed. In the case of the cruiser *Good Hope* the last knot of speed designed to be attained (23 knots) necessitated the development of 9,000 additional horse power. In the case of the Cunarders it is possible that while 23 knots may be got with 35,000 I.H.P. 24 knots will probably necessitate an increase of one-third to the power, the coal consumption and the engine room stores. Clearly a new departure in this direction is not one to be lightly made.

SHIP BUILDING AT PHILADELPHIA.

Philadelphia, March 26.—The trio of torpedo boat destroyers, *Bainbridge*, *Barry* and *Chauncey*, will be given a trial trip in the near future and their contract speed requirement of 29 knots will be reduced to 28. So many changes have been made in the original design, with a resultant increase in displacement, that the speed was necessarily reduced. It is explained by the builders that the navy officials preferred strengthening and increasing the durability and safety of the vessels, even at the cost of a knot per hour. The *Bainbridge*, first of the trio turned out by the Neafie & Levy company, was driven to her limit on her official trial run several weeks ago in the Chesapeake bay and it was found that 28 knots was the very best that she could do. The blower system was defective and this portion of the machinery has since been replaced by a much stronger apparatus.

Rarely has so numerous and distinguished a company attended the launch of a torpedo boat as that which witnessed the maiden dip of the *Barry* last Saturday. President Roosevelt and the secretary of the navy were unable to be present, but were represented by naval officers, and men of rank in the army as well. Miss Charlotte Adams Barnes of New York city, a great grand daughter of Patrick Barry Hayes, an adopted son of the famous Com. John Barry of the United States navy, broke the proverbial bottle of champagne over the sharp bow of the destroyer, as with steam already in her boilers and smoke issuing from her funnels she slid gracefully into the Delaware. Pres. Matthias Seddinger of the Neafie & Levy company said that the *Barry* could have been launched months ago but that she was kept on the ways pending the result of the experiments being made on the *Bainbridge* and *Chauncey*. These boats are 245 ft. long, with a beam of 23 ft. at the water line. The displacement is about 450 tons. The engines are of the four-cylinder quadruple-expansion type. The indicated horse power, according to contract, is 8,000, but it is said that in the instance of the *Bainbridge* nearly 9,000 H.P. was developed. The armament of the boats will consist of five 6-pounders, two 12-pounders and one 12-pounder in each conning tower, all rapid-fire guns. In addition each boat will carry two torpedo tubes, one fore and one aft.

The imperial Russian battleship *Retvizan* went in commission at Cramps' ship yard last Monday. A salute of twenty-one guns was fired and a few moments later it was returned by the shore battery at the League Island navy yard. As soon as the blue cross of St. Andrew was hauled up at the *Retvizan's* peak she was towed to an anchorage in the stream. Before Saturday it is thought that she will have sailed for home. Capt. E. N. Stchensnovitch said that the destination of the battleship was the Kronstadt naval station. On arrival at the station she will be inspected by the czar, who has manifested the liveliest interest in this latest product of the famous Philadelphia ship yard. While the engines of the *Retvizan* are new and comparatively untried, they will be practically in the charge of an engineer from the Cramp yard, who will remain aboard for some months after the vessel has been assigned to her future station. In the line of repairs Capt. Stchensnovitch hopes to duplicate the record of the famous *Variag*, on which not a single cent was necessary for repairs after her trip across the Atlantic. Engineers in this locality regarded this

as a wonderful feat when the magnitude of the machinery for propulsion is taken into consideration. It was considered unnecessary to draw a single piston for examination of the packing rings or to make any change whatever in the alignment of the engines.

The New York Ship Building Co. is engaged in the purchase of material to enter into the construction of the big oil tanker for which they recently signed a contract with the J. M. Guffey Petroleum Co. It has been decided that oil shall be used as fuel, but the grate arrangement will be such that the change can be readily made to coal if conditions require it. The trip of the tanker *J. M. Guffey*, formerly the *M. S. Dollar*, using petroleum, was eminently a success, the results from the standpoint of economy being such that this company feels justified in altering all of the vessels controlled by them for oil fuel as soon as practicable. With the *Paraguay*, the J. M. Guffey and the vessel now building the new oil company will have a trio of petroleum carriers second to none in the world. It is said that their representative will shortly leave for another tour of the lakes with the hope of securing an additional craft which can be readily changed into a tanker.

The William Cramp & Sons Ship & Engine Building Co. expect to launch the new International Navigation Co.'s liner *Finland* during the second week in April. The *Kroonland* is being rapidly rushed towards completion in order that she may be ready for the late summer travel from the other side.

MR. WALTER A. POST ON THE SHIPPING BILL.

Newport News, Va., March 26.—No measure has ever been introduced in congress having such a vital and important bearing upon the future of Newport News, and other ship building communities, as the shipping bill. While there is some opposition to the bill, all concede that the effect of its passage will be the promotion of the American ship building industry and that the effects of the measure will be immediately felt in this direction. The passage of the bill by the senate has already had an encouraging effect here. Gen. Supt. Walter A. Post of the Newport News Ship Building & Dry Dock Co. was asked for some expression that would give an idea of tangible results that might be expected to develop in Newport News upon the bill's passage by congress.

"With the enactment of a satisfactory law," said Mr. Post, "the capital invested in ship building in this country will be more than doubled. A gratifying point is that an enormous amount of foreign capital will be invested, so that, in addition to more than doubling the ship building capacity of the country, we bring in foreign money with which to help us do it. Much of this capital will be spent in the development and improvement of existing yards, and their enlargement so as to meet the increased demand for ship building that is certain to follow the passage of the measure. Foreign steamship companies are largely interested. The present bill is wider in its scope than the original bill, for it lets in the ship that is entirely rebuilt in this country. There are many ships to be rebuilt, provided it is worth their owner's while, and you can naturally imagine that we hope to get our share, not only of the original construction but of the reconstruction.

"You must bear in mind that there is no industry in existence that helps a community more than a ship building industry. It deals with the outside. It takes no money out of a community, but brings money in from other communities and leaves certainly half of it in the city in which the plant is located. Half the cost of building a ship is in labor. Of our business of \$6,000,000 a year we put \$3,000,000 every year in Newport News. If our business increases, as it will do undoubtedly under a proper ship subsidy measure, the amount of money brought to Newport News directly by the ship yard will be correspondingly increased, as you can see. The fact requires no argument, not even demonstration. It must be remembered that a ship yard helps every other industry in the city. Take the Chesapeake & Ohio railroad for instance. It is the other great factor in the building up of this city. We, of course, do a big business with the road, as our material comes in over this line. Of course, additional men must be employed to handle additional business and the more business the more men employed; the more men employed by us the more business for everybody, corporation and individuals.

"You ask me about the increase in the number of employes at the ship yard in the event the bill goes through. I believe you can safely say that this yard will be employing at least 12,000 men within three years. It does not require a telescope to see what that means for Newport News. I said that foreign shipping companies are interested. You will agree with me when I tell you that we have recently received an inquiry from one of these foreign steamship companies, owners of a great existing line, asking us in what time we will agree to deliver to them twenty large freight steamships in the event of the passage of the bill."

When asked if this yard would build any more lumber ships similar to the one recently contracted for by a Pacific coast firm, Mr. Post stated that he hoped to secure contracts for several additional vessels for the same traffic, but their probable construction will have no connection with the ship subsidy bill, as these ships do not come within the scope of the measure. They are for the coasting trade.

OPPOSED TO THE METRIC SYSTEM.

Rear Admiral A. T. Bowles, chief constructor of the navy, has addressed a remonstrance to Secretary Long against the adoption of the metric system by the United States. The house committee on coinage, weights and measures a few days ago authorized a favorable report on the bill providing that after Jan. 1, 1904, all departments of the government should employ only that system. In his report Admiral Bowles says he considers it practically impossible to employ the system in the plans and specifications for the structure of vessels in advance of its general adoption throughout the country. If the construction bureau were required to adopt the metric system it would be necessary, in the first place, to change the scales upon which the plans are prepared. The art of naval architecture, he says, is to a great extent an empirical one, the success of the design depending largely upon the comparison of previously obtained data and results. Therefore comparative value of different unities is an essential part of the work of design, and the judgment of the naval architect, draftsman, designer, business man, purchasing agent or workman in the new units would be of no value whatever. The plans of ships of present and past navies, he says, would become at once almost valueless.

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Senator Hawley of Connecticut is reported as having said in the debate on the bill to protect the life of the president: "I have an utter abhorrence of anarchy and would give \$1,000 to get a good shot at an anarchist." This is a very pertinent reminder of the man who said of his son "I have noticed that Johnny has taken to swearing, but where the — he learned it I can't imagine." We are not advised as to the present status of the bill to additionally safeguard the president, but it has either passed one or both the houses of congress. It is undoubtedly necessary that the responsible heads of governments should take reasonable precautions to insure the security of their lives. Three have been slain in thirty years in the United States and other nations have a yet bloodier record. The remedy, however, is not the mere extermination of the individual assassin. It should go deeper than that. The greatest security is in teaching the doctrine of the sacredness of human life from the highest to the humblest. The poor wretch in the gutter must be taught to know that his life is held precious in the eyes of mankind. It is a gift from God, inviolate, and no one has a right to take it from him. All share and share alike in this priceless heritage. This is the doctrine which should be taught and which can be carried home to every balanced mind. It is only against the unbalanced mind that human teachings are as naught; and that is why reasonable safeguards should be thrown about the chief executive. Anarchistic literature, which is pernicious and offends the great principle of the sacredness of life, should be suppressed, but the life of the anarchist should not be taken. He should be lifted out of anarchy by taking away the influences which are warping his mind. This bill to protect the life of the president by putting to death even those who may attempt his life is an unwise measure. It establishes an inequality which should have no place in a free country. The president's life is no more sacred than that of the lowliest citizen. All life is sacred and should not be taken without due process of law. If Senator Hawley said what he is credited with having said he is a disciple of anarchy. But we doubt very much whether the senator said it. The president can do as much as the vast machinery of the state to preserve his own life by abolishing foolish customs, such as, for instance, the indiscriminate personal meeting of bodies of persons who have nothing but petty vanity to gratify by calling upon him.

The movement to celebrate the semi-centennial anniversary of Sault Ste. Marie canal is gaining headway. On June 4, 1903, a half century will have passed since ground was broken for this greatest of canals in point of commerce; and since the movement to celebrate the event was started by the Review all the papers throughout Michigan and the upper peninsula have taken it up. The Hon. Peter White, Marquette's first citizen, has recently been in Washington and has enlisted the interests of a number of the senators in the anniversary celebration. Peter White has always had a warm spot in his heart for Sault Ste. Marie, having gone there first in 1845. This was in the days when the rapids of St. Mary's river were the insuperable barrier to commerce and when a canal in that remote section of the earth was being vigorously opposed by Henry Clay and other leaders of the nation. How little they knew that beyond St. Mary's river lay the iron ribs of the country. Mr. Sheldon of the upper peninsula of Michigan has offered a resolution in the house of representatives to celebrate with appropriate exercises the construction of this canal, and as soon as it is adopted, a complement resolution will undoubtedly be presented to the senate. It has been suggested, and it would be well for the boards of trade in the various lake cities to adopt resolutions favoring the celebration; and for citizens in general to write to their representatives. Nothing could so direct attention to this great canal as a national celebration. No other locality affords such striking evidence of what fifty years has accomplished. Sheldon McKnight and his old gray horse were the means of transportation fifty years ago; the means of transportation today is the most magnificent fleet of vessels that has ever sailed under a single flag. Great interest is manifested throughout the lake region in the proposed celebration and it is hoped that the resolution may be adopted by congress without hesitation.

Since the passage of the shipping bill by the senate nothing has been done to enact it into a law. Representative Grosvenor, chairman of the house committee on merchant marine and fisheries, has taken no steps to outline a program for it. There is a widespread impression among republican members of the house that no attempt will be made to pass the bill

during the present session but that it will be allowed to go over to the short session next winter. The fact that six republican senators voted against the measure in the senate and that two of them are from Iowa, the state from which the speaker of the house comes, has led a good many members to believe that the speaker will oppose any plan looking to the passage of the measure at this session, and that if he does he will have enough influence to prevent action. The speaker is disinclined to explain his attitude towards the bill and it is not definitely known whether the reports of his opposition to it are true or not. Some timid members are urging that it would be much wiser, from a political standpoint, to pass the bill next winter, after the congressional elections, but they apparently forget that the bill has already received the indorsement of the republican national convention and was an issue during the last presidential campaign.

Canadian manufacturing interests are at present urging a readjustment of the tariff on steel rails and structural shapes. Canada has encouraged the manufacture of steel within her borders by both tariff and bounty, but the benefits are confined to certain forms of steel. Steel rails and certain of the heavy forms of structural steel were not included in the gifts of the government. At the present time structural steel weighing up to 35 lbs. per lineal yard is dutiable at \$7 per ton. The duty on steel weighing more than 35 lbs. per lineal yard is 10 per cent. Steel rails for electric car and tramway purposes are now dutiable at 30 per cent. The same rate of duty is charged upon light rails weighing up to 45 lbs. per lineal yard, but all rails besides those included in these two items, weighing over 45 lbs. per yard, are admitted into Canada duty free. Canadian steel makers are anxious that steel rails of whatsoever weight shall be protected.

When men venture out of their calling how sad the road becomes with their countless mistakes. Senator Depew endeavored in the senate the other day to instruct Senator Tillman in yachting. During the debate on the shipping bill Mr. Tillman wanted to know what kind of a yacht the Meteor was that the emperor of Germany had ordered. Mr. Depew instantly replied out of the fullness of his knowledge that it was a "sailing racing machine of the same type as beat the two Shamrocks." If the worthy junior senator from New York wanted to be as far from the truth as possible he couldn't have employed a better phrase. She is conspicuously not a racing machine; she is a safe, comfortable, speedy, cruising yacht.

Wide circulation has been found for reports alleging that the United States Steel Corporation contemplated a general advance of prices to take effect April 1. The truth of these reports has been authoritatively denied. As the Steel Corporation is booked up to the limit of its capacity for three-quarters of the year, and on certain grades for the entire year, it could not possibly have a present benefit from any advance in prices. The Steel Corporation believes that its products are now commanding prices that are fair to both producers and manufacturers. Indeed, the Steel Corporation has exercised its influence among the independent steel manufacturers to have them keep prices down.

Receipts from taxes in Canada during 1901 aggregated \$38,743,000 and the total revenues \$52,000,000. The total expenditure was \$57,900,000, which adds an indebtedness of \$6,000,000 to an already existing deficit of \$262,000,000. These figures prove that Canada has faith in its future.

BRITISH NAVY ESTABLISHES ENGINEER SCHOOL.

An official letter has been received at Washington from one of the officers of the royal navy informing the United States authorities that the British admiralty has decided to establish an engineer school at Keyham, England, where the royal naval school is established. To officers of the American navy this is a significant demonstration of the careful manner in which the great maritime nations watch each other in the race for naval supremacy. It was not more than three or four years ago that the authorities of the imperial government of Germany initiated the naval engineer school by organizing a scientific laboratory at Charlottenberg, where the merchant vessels, in addition to her men-of-war, were forced to go for an examination before being placed in commission. This school has attracted the attention of engineers of the American navy, and for two years past Admiral Melville has recommended to congress that an appropriation be authorized for the establishment of a naval engineer school in this country. The committee on naval affairs has just approved the recommendation made by the engineer-in-chief for the appropriation of \$350,000 for the erection of a building for this purpose at Annapolis and \$150,000 for its equipment. Officials have reason to hope that this item will be included in the regular naval bill, which will soon be considered. The chief work to be conducted at the naval laboratory, as set forth in the present plans, would be testing ordnance appliances and patents, and also to afford special scientific training for young men in the navy on technical questions of engineering. There are innumerable questions in regard to propellers, tubes, boilers and other things which naval officers think should be elucidated after experiments in a laboratory.

Pinney & Warner is the name of a new firm of Cleveland lawyers. Both of the gentlemen—O. C. Pinney and Dorr E. Warner—are well known in Cleveland business circles. Mr. Pinney has made a specialty of maritime law.

REMARKABLE EXPERIENCE OF THE ASUNCION.

The San Francisco Call prints the following remarkable story of the experience of the lake-built steamer Asuncion on a trip with a cargo of coal out of Tacoma. The caption of the story is "Submarine Navigation Saves Asuncion from Destruction." It says:

"The steam collier Asuncion, which arrived yesterday after a tumultuous voyage from Tacoma, has added one more chapter to the history of submarine navigation. For four days of the five days and eighteen hours of her voyage the Asuncion was under water. How she escaped foundering is a marvel to shipping folk, but Capt. Evans declares that he could have carried 500 tons of coal more than he brought down. The Asuncion left Tacoma March 11 and rounded Cape Flattery in a howling southwester. Heavy seas swept over the deeply-laden coal carrier, and at 8 a. m. of the following day she gave up the struggle, turned tail and ran back for the shelter of the straits. Storm signals were flying at Neah bay. Capt. Evans decided to anchor in Clallam bay until the weather cleared up. Clallam bay, however, was already crowded with sailing craft, so the Asuncion continued the retreat until she reached Port Angeles, where she remained at anchor until the storm signals were hauled down. She resumed her voyage. After rounding Cape Flattery the wind and sea again got angry. The violence increased until a heavy gale was blowing, accompanied by a tremendous beam sea. It was then that the Asuncion went under. The smokestack remained out of water and the officers on the bridge, although repeatedly drenched by big seas, managed to get along without artificial air supply. The rest of the vessel disappeared, however, and it was only by the thump of the machinery that the men on the bridge knew she was still attached to the upper works. She was hove to on March 14 for four hours, during which time such of her as was not submerged was pelted with hail and snow. The latter part of the trip was made in fairly good weather. The Asuncion is an unlucky ship so far as weather is concerned, but lucky in surviving conditions that would destroy most vessels of her class. Vessels leaving northern ports before and after her made good weather. The Mackinaw, which left Tacoma only a few hours before the Asuncion, came down in ninety-two hours. The Asuncion's voyage occupied 138 hours."

PREDICTED EFFECT OF SHIPPING BILL.

A New York special says: There has been such a heavy demand for steel plates and forms in the last few weeks that several of the prominent steel plants doing business in the east have raised their prices \$2 per ton above the association base price of \$35 per ton. Most of these concerns have orders booked for six months in advance, and all orders requiring prompt delivery are refused. The industry which has probably suffered more than any other from a lack of supply of steel plates is in the ship building industry. The passage of the ship subsidy bill will tend to increase instead of diminish the heavy demand for ship building materials, particularly as regards steel plates and frames. It is asserted that many ship yards have plans filed for the construction of new vessels conditioned upon the passage of the ship subsidy bill, and that it will be six months to a year before the mills will be able to deliver any steel plates for this work. Concerning the steel plate situation, a representative of one of the largest companies said:

"It is true that while most of the concerns in the steel pool are selling at the base prices of \$1.78, a few are getting as high as \$1.88. While they cannot go below the minimum price fixed by the pool they can sell all the material available at prices above that figure. Under existing conditions an advance is certainly justifiable in many instances. Practically every concern is booked far ahead and new orders show no indication of diminishing. Besides, the scarcity of billets has been felt more or less severely, and the prices which many of the concerns have been obliged to pay have operated to help an advance in the price of steel plates. The development of our merchant marine in the coasting trade is a factor which has given an impetus to the steel plate industry. If the ship subsidy bill goes through and ships are required for foreign trade you can look for a still greater development in the steel plate industry and at the same time higher prices for plates."

BATTERIES OF THE OHIO CLASS OF BATTLESHIPS.

Notice has been received at the navy department that within the next six weeks the contractors having charge of the construction of the battleships Maine, Missouri and Ohio will be ready to place the new 12-in. 40-caliber guns in the batteries of the vessels. The designs for the guns were completed about four years ago when the ordnance bureau recommended that they be adopted on all new vessels. Only eight of them have been sent out from the machine shops at the Washington navy yard, and these were set aboard monitors which have recently been put into service. An order will be given to send four of these guns to the Cramps' yard for the Maine's battery in a few days. The Maine is nearer completion than the two other vessels of her class, and she will be ready to have her battery set two or three weeks before the Ohio and the Missouri. All the vessels will probably be ready to be put in commission in about a year. All their equipment and their batteries are of the most modern pattern, and they will add materially to the strength of the navy. The design for the new 12-in. guns to be placed on them is the result of years of development and improvement in the ordnance bureau. The gun is 5 ft. longer than the old one, and explodes its shell with greater force. Word has been received at the navy department from the Bethlehem Steel Co. that the 6-in. steel Krupp armor plate ordered for one of the big battleships which has been undergoing construction there would be sent to Indian Head soon. This armor plate weighs about ten tons. Under direction of Lieut. Davis a test will be made at the Indian Head proving grounds in the next two weeks.

SHIP YARD NOTES.

The first four-masted schooner ever built at Bangor, Me., is to be constructed this season in the yards of E. & I. K. Stetson. The vessel is to be of about 1,000 tons gross. She will cost \$50,000 and the shares have been taken by Boston, New York and Bangor parties. A novelty in the construction of this vessel will be that she will have no knees of any kind, their place being taken by belt courses or strakes of hard pine, locking over the deck beams, top and bottom. It is claimed that these belts will

give her more stiffness than would any number of knees, while leaving more space for cargo and allowing of better stowage. The vessel will have a complete steam plant for pumping, making sail, getting the anchors, working cargo and heating the houses, fore and aft. She will be launched in October.

The Rodgers Sand Co., Pittsburgh, Pa., has awarded a contract for a new dredge boat to the Parkersburg Dock Co., Parkersburg, Ky. The steamer will be modern in every particular and equipped with the latest improved machinery for digging sand from the rivers. She will cost, when completed, \$35,000. The craft is to be 35 ft. long, 27 ft. wide and 4 ft. 6 in. deep.

The Inland Marine Construction Co., which recently bought out the Knox Boat Yard at Marietta, O., has received an order from the government for a repair boat for use by the government engineer in the Pittsburgh division. The vessel will be 125 ft. long, 26 ft. beam and 4½ ft. deep. The company is expecting other contracts in the near future.

A three-masted wooden schooner building at the New England Co.'s yards, Bath, Me., for Capt. M. D. McKeown of Boothbay, Me., is framed out. It is expected that the craft will be ready for launching on June 1. She will be named Alice M. Davenport.

Thomas McCosker & Co., Baltimore, Md., have just launched the hull of a large dredging and pulsometer machine for the Baltimore Dredging Co.

FROM THE FORE RIVER WORKS.

Boston, March 26.—The steel lower masts being built at the Fore River ship yard at Quincy, Mass., for the seven-masted steel schooner which is under construction there, are the largest ever attempted, and on account of their size and the unusual strains to which they are likely to be subjected, have been designed on somewhat different principles from those applied to an ordinary steel mast. Each of these lower masts will be 135 ft. long and 31 in. in diameter. The schooner's spike bowsprit is also being built of steel, and at the same time work is going on upon the other spars, the 60-ft. topmasts being cut out of Oregon pine. All of the wooden joiner work, cabin fittings and steel deck houses are completed and ready to be put in place, and the blacksmith work for the mast fittings has been begun.

The gun forgings which the Fore River company is making for the United States government are being rapidly completed and numerous shipments have been made to the Washington navy yard. A large consignment of forged and rough-turned guns left Quincy last week and another lot will be shipped in a few days.

The rudder for the United States cruiser Des Moines is now being set up in the machine shop at the Fore River works. The stock, frame and outside plating is of manganese bronze, and the blade will be filled in between the framing with white pine planking.

NEW ORLEANS SHIP BUILDING AND DOCKING CO.

Mr. S. B. McConnico, the representative of eastern capitalists who propose to build a ship yard at New Orleans, has given the following statement to the press:

"The Crescent City Construction Co., organized under New Jersey laws, has taken a contract to build and equip the plant of the New Orleans Ship Building & Docking Co. at New Orleans. The officers of this construction company are: Charles M. Jesup, president; S. B. McConnico, second vice-president; W. N. Coler, Jr., treasurer; F. B. Crawford, secretary; C. P. E. Burgwyn, manager of construction; Lewis Johnson, superintendent of operating department. The company will inaugurate construction as soon as \$2,000,000 of the bonds are subscribed for. The greater portion of these have already been placed, and the balance will shortly be underwritten. New Orleans will be given an opportunity to subscribe, and it is hoped that a large number of our towns people will take an interest in this important enterprise, the success of which is now assured, and the profitableness of which is beyond doubt. The New Orleans interest will be represented on the board of directors by several prominent local gentlemen, whose names will be announced soon. The lands for the site are all covered by options, except two small pieces controlled by the state, and satisfactory assurance has been given that these will be granted as soon as the legislature convenes. The bonds will be brought out through the Southern Securities Co. of New York, which will act as the eastern financial agent of the construction company."

HAMBURG-AMERICAN CO.'S NEW LINER, MOLTKE.

The Hamburg-American Co.'s new liner Moltke arrived in this country last week on her maiden trip from Hamburg. The Moltke is a twin-screw boat, intended to perform the same character of service as the Pennsylvania, the Patricia, the Pretoria and the Graf Waldersee of the same line. This steamer and her sister ship, the Blücher, which will make her maiden voyage in a few months, will cross in slightly better time than the four vessels named, being equipped with engines of 8,000 H.P., capable of giving them a speed of 16 knots an hour and carrying them across from Cherbourg and Plymouth in nine days and from Hamburg in about ten days. There are many people who prefer large steamers of medium speed to fast express steamers for their ocean voyages because of the steadiness and the longer time it gives them at sea. At the same time, they like the luxurious surroundings of the record breakers. The Moltke and the Blücher are intended to meet this demand. They are 12,334 tons gross, 525 ft. long and 62 ft. beam, and fitted with large bilge keels. The Moltke is fitted with all the modern conveniences known to marine architecture, and is provided with two novel features for steamships—a grill room and a gymnasium. In planning the staterooms many single-berth rooms were provided for. In the second cabin not more than three passengers will be placed in rooms which are generally occupied by four persons on other steamers. There are a number of rooms in this cabin for two passengers as well. Numerous water-tight compartments and a double bottom make the hull as safe as man has yet devised. The Moltke was built at the yards of Blohm & Voss, Hamburg, and is commanded by Capt. C. Dempwolf.

OFFICERS OF LAKE VESSELS FOR 1902.

CORRIGAN, JAMES, Managing Owner, Cleveland.

Str. Australia	Capt. J. W. Brion	Engr. P. J. Navaugh.
" Bulgaria	" Ed. Rains	" J. H. Smith.
" Caledonia	" R. Donaldson	" F. Craig.
" Italia	" J. McArthur	" E. Mercier.
" J. Emory Owen	" N. L. Miner	" J. Radford.
" Robert Wallace	" J. W. Nicholson	" C. Stedman.
" Quito	" U. S. Cody	" H. Henry.
" Iron Age	" F. Chilson	" J. Callan.
" Iron Chief	" Geo. Symes	" F. Gordon.
" Iron Duke	" W. A. Ashley	" J. Kimberly.
" Minnesota	" H. Peters	" S. Moore.
" Progress	" F. D. Perew	" H. Haynes.
Schr. Amazon	" R. DeLong.	
" Ashland	" A. Adams.	
" Polynesia	" A. D. McKay.	
" Tasmania	" Wm. Radford.	
" Iron Cliff	" M. Kurth.	
" J. M. Hutchinson	" J. McArthur, Jr.	
" F. D. Ewen	" M. Pridgeon.	
" J. I. Case	" Sam Gould.	
" M. W. Page	" H. Morey	

ANCHOR LINE, E. T. Evans, Western Manager, Buffalo.

Str. India	Capt. H. O. Miller	Engr. Jno. Forrester.
" China	" Chas. Christy	" Jno. Wise.
" Japan	" John Doherty	" Wm. Wilson.
" Alaska	" F. F. Williams	" A. D. Birdsall.
" Wissahickon	" H. Cronkhite	" A. Fraser.
" Delaware	" P. O'Neil	" Wm. Garritty.
" Juniata	" Geo. J. Delaney	" Jno. Clark.
" Conestoga	" Moses Boggan	" A. E. Welch.
" Lycoming	" J. H. McAvoy	" Chas. Allender.
" Conemaugh	" F. Bloom	" A. Edgar.
" Lehigh	" E. Martin	" Tim Griffin.
" Clarion	" L. Wright	" F. Rehbaum, Jr.
" Susquehanna	" D. Ryder	" F. Rehbaum, Sr.
" Codorus	" A. McKenzie	" Wm. Swain.
" Schuylkill	" Chas. Nelson	" Jno. Jordan.
" Mahoning	" Jos. Corcoran	" Al. Black.

TONAWANDA IRON & STEEL CO., N. Tonawanda, N. Y.

Str. Fleetwood	Capt. Edward Sullivan	Engr. T. J. McDonell.
" Jno. F. Eddy	" O. J. Solean	" F. Trinkwalder.
" Oceanica	" C. S. Furey	" Ed. Knibbs.
" Geo. Spencer	" A. C. Hansen	" W. J. Wray, Jr.
" Clyde	" J. S. Neal	" E. H. Parry.
" Veronica	" David Carrier	" J. Oscar.
" C. F. Curtis	" Jas. Cunningham	" W. J. Cunningham
Schr. 101	" J. J. Carr.	
" T. S. Fassett	" Jno. Barclay.	
" N. C. Holland	" J. H. Christie.	
" Moravia	" Peter Keischgens.	
" B. L. Pennington	" W. P. Johnson.	
" Amboy	" F. P. McGreevey.	

HINES LUMBER CO., EDWARD, Chicago.

Str. S. S. Wilhelm	Capt. Wm. Roach	Engr. Wm. Helmholz.
" Santa Maria	" S. B. McCann.	" A. J. Smith.
" Oscoda	"	"
" L. Pahlow	" Jas. Carr.	" G. Quackenbush.
" A. Folsom	"	" Reuben Ellis.
Schr. Galatea	" A. Germain.	
" Nirvana	" Jno. Hudson.	
" Wayne	" Eli Jacques.	
" S. E. Marvin	" C. K. Moore.	
" D. L. Fitch	" J. Jennings.	
" Ida Corning	" P. H. Edgar.	
" Delta	" Jno. Bates.	
" City of Chicago	" F. Anderson.	
" Alice B. Norris	"	

HALL COAL CO., GEO., Ogdensburg, N. Y.

Str. Hecla	Capt. D. Houdigan	Engr. D. M. Doyle.
" Rugee, John	" R. Fitzgerald	" A. E. Cline.
Tug W. L. Proctor	" W. A. Russell	" J. W. Estes.
" Mary P. Hall	" Jos. Richard	" R. G. Jardin.
Schr. W. A. Sherman	" M. Houdigan.	
" Bolivia	" Jos. Goodwin.	
" E. P. Beals	" Louis Dion.	
" Jennie Matthews.	" F. D. Lum.	
" Mary Lyon	" S. LaFlam.	
" Diamond	" P. Sylvain.	
" Argosy	" Geo. Robinson.	
" Mohawk	" P. P. Ledue.	
" Onandaga	" L. Ledue.	

WILSON TRANSIT CO., Cleveland.

Str. H. W. Oliver	Capt. W. W. Dawley	Engr. F. C. Stoeber.
" Capt. Thos. Wilson	" J. S. Wood	" F. Harmon.
" Andrew Carnegie	" C. C. Tousley	" J. F. Derrigs.
" W. D. Rees	" C. A. Benham	" J. N. Kirby.
" Yuma	" D. Buie	" J. Heinkelmann.
" Spokane	" Jas. Higgins	" C. Stoeber.
Schr. D. Z. Norton	" J. D. McPherson.	

PRINDIVILLE & SON, JOHN, Mgrs., Chicago.

Str. Hadley	Capt. M. Fitzgerald	Engr. John Hogan.
" Panther	" J. H. Madden	" E. Scott.
" Jesse Spalding	" Jas. Travis	" Fred Otto.
" Niko	" Thos. Beggs	" L. Manion.
Schr. A. M. Peterson	" Chas. Bough.	
" Massasoit	" D. Buchanon.	

CALBICK & CO., J. A., Chicago.

Str. Kalkaska	Capt. Thos. Higgins	Engr. C. F. Jubenville.
" Oregon	" Frank Elliott	" G. Girtung.
" J. H. Prentice	" Robert Davis	" F. R. Winkle.
" P. J. Ralph	" Ira Mansfield	" Wm. Galpin.
Schr. Harold	" L. Davidson.	
" Oak Leaf	" A. T. Hansen.	
" R. L. Fryers	" E. Christen.	
" Halstead	" Jno. Lundberg.	
" Middlesex	" Paul Weimar.	
" S. H. Foster	" Fred Weimar.	
" Connelly Bros.	" Carl Johnson.	

BARRY STEAMBOAT LINE, Chicago.

Str. C. H. Hackley	Capt. L. Larson	Engr. M. Mack.
" Alice Stafford	" Wm. Coleman	" Jas. Reid.
" F. & P. M. No. 1.	" Thos. Barry	" Jos. Hitchcock.
" City of Fremont	" Ed. Evans	" C. Grubbens.
" City of Gr'd Rapids	" Wm. Pitman	" J. Collams.
" Empire State	" Jos. Lamoreaux	" Wm. Hackett.
" Badger State	" Jas. Kelley	" Jos. Sheeny.
" Robert Burke	" Jno. Doyle	" R. Drumer.
" Gordon Campbell	" Jno. McAvoy	" Jos. Ridden.

TONAWANDA BARGE LINE,

Capt. Wm. Dulac, Mgr., Mt. Clemens, Mich.

Str. Canisteo	Capt. C. W. Woodgrift	Engr. Jno. Deihl.
" A. Weston	" D. McKinzie	" E. Cottrell.
" C. A. Street	" Jno. Hanson	" Fred Beebe.
Schr. J. B. Lozen	" Jno. F. Lozen.	
" J. Godfrey	" A. Elsey.	
" A. Stewart	" N. Forton.	
" Eleanor	" F. Duboy.	
" Jeanette	" R. Moore.	
" Fulton	" F. Laforge.	
" S. B. Pomeroy	" Frank Desot.	

GOODRICH TRANSPORTATION CO., Chicago.

Str. Columbus	Capt. Robt. Smith	Engr.
" Virginia	" H. E. Stines	" G. P. Roth.
" Atlanta	" Geo. Pardee	" J. Peroutka.
" Indiana	" A. A. Gallagher	" W. J. Jerome.
" City of Racine	" J. A. Wilson	" Alex. Currie.
" Georgia	" C. T. Bronson.	" T. Corrigan.
" Iowa	" Jno. Raleigh	" J. Buschman.
" Chicago	"	"
" Sheboygan	" E. E. Redner	" F. Neider.

BOLAND, JOHN J., Buffalo.

Str. Kittie M. Forbes	Capt. D. O'Hagan	Engr. S. Mallon.
" Pridgeon	" Jno. O'Hagan	" Chas. Butler.
" Garden City	" John Devaney	"
" S. E. Sheldon	" Geo. McGrain	"
Schr. Saveland	" Debeau.	
" Brunette	" Hugh O'Hagan.	
" D. P. Rhodes	" Frank Brown.	
" Negaunee	" Olson.	
" John Magee	" Alic Gordon.	

SHANNON & GAREY (Jos. & J. C.) Saginaw, Mich.

Str. Robt. Holland	Capt. J. C. Garey	Engr. L. Van Liew.
" W. P. Thew	" C. E. Garey	"
" Wyoming	" Wm. H. Ellery	" Chas. Morgan.
Schr. Exile	" J. W. Hall.	
" White & Friant	" Jno. Trudo.	
" Wm. Crosthwaite	" Jno. Lennon.	
" T. G. Lester	" A. Cameron.	
" Monticello	" Robt. Rabadue.	

NORTHERN NAV. CO. of ONTARIO, Ltd., Collingwood, Ont.

Str. Majestic	Capt. P. M. Campbell	Engr. J. W. Aston.
" Collingwood	" R. D. Foote	" C. Robertson.
" Germanic	" Jas. Wilson	" Jos. Aston.
" Midland	" E. Walton	" Wm. Whipps.
" Atlantic	" Wm. Playter	" D. McLeod.
" Britanic	" Fred Moles	" S. Burgess.
" Toronto	" Wm. Lereux	" Wm. Harman.

GILCHRIST, F. W., Alpena, Mich.

Str. Viking	Capt. H. Richardson	Engr. L. Richards.
" Norseman	" H. Bennett	" H. Parker.
" S. C. Hall	" H. L. Foster	" W. Hamilton.
Schr. Vinland	" T. Stevens.	
" Nellie Mason	" C. Mitchell.	
" Sam Flint	" H. Hamilton.	
" Russian	" J. Hamilton.	

LEATHAM & SMITH TOWING & WRECKING CO.,

Sturgeon Bay, Wis.

Str. Pewaukee	Capt. L. F. Strohan	Engr. Mark Holt.
" Jos. L. Hurd	" Sam Christopher	" C. D. Elliott.
" J. N. Foster	" C. L. Anderson	" Pat Curry.
Tug John Leatham	" Henry Tufts	" Frank Larson.
" Geo. Nelson	" James Tufts	" Jno. Riley.
Schr. Advance	" Andrew Olson.	
" Alert	" Abe Everson.	

MUELLER COMPANY, WM., Marquette Bldg., Chicago.

Str. Mueller	Capt. Henry Dawson	Engr. G. G. Randall.
Schr. Belle Brown	" E. Fitch.	
" Butcher Boy	" H. W. Woerpel.	
" Richard Mott	" Wm. Powers.	
" Parana	" Max Delatre.	

ROBINSON BROS. LUMBER CO., N. Tonawanda, N. Y.

Str. C. H. Green	Capt. C. E. Little	Engr. Wm. Ormsby.
Schr. Genoa	" Dan C. Ryan.	

BLODGETT, O. W., Bay City, Mich.

Str. C. H. Bradley ... Capt. Jas. Bennett ... Engr. R. C. Spiers.
 " Zillah ... " M. Canartney ... " Jas. Spiers.
 Schr. Mary Woolson ... " W. Allen.
 " Brightie ... " L. D. Bennett.
 " Peshtigo ... " Wm. Hazen.
 " Goshawk ... " J. Girdon.
 " B. W. Jenness ... " W. Keenan.

RICHARDSON, W. C., Cleveland.

Str. J. H. Wade ... Capt. Richard Call ... Engr. Jno. McMonagle.
 " J. H. Devereux ... " C. R. Cleveland ... " Thos. Shannon.
 " Iroquois ... " E. J. Burke ... " L. L. Brown.
 " J. H. Outhwaite ... " Ralph Nutting ... " R. A. Davidson.
 Schr. Crete ... " Eberlein.
 " Mary B. Mitchell ... " Jno. McKeighan.

**MINCH & NICHOLAS TRANSPORTATION COMPANIES,
Wm. Gerlach, Mgr., Cleveland.**

Str. I. W. Nicholas ... Capt. N. B. Nelson ... Engr. A. E. Meeker.
 " Onoko ... " W. H. Johnson ... " T. A. Morrill.
 " Philip Minch ... " D. Hutcheson ... " J. P. Klaser.
 " Wm. Chisholm ... " H. Hinslea ... " Geo. Milne.
 " John N. Glidden ... " John Smith ... " J. W. Deitch.

CROSTHWAITE, J. L., Buffalo.

Str. St. Louis ... Capt. James Brines ... Engr. M. B. Townsend.
 " Chas. Beatty ... " John Milne ... " Harry Lindsley.
 Tug Elk ... " A. Booth ... " A. W. Booth.
 Schr. Champion ... " Jno. H. Mills.
 " Buckeye State ... " R. C. Smith.

LAKE MICHIGAN CAR FERRY TRANS. CO.,**(Controlled by Wisconsin & Michigan Ry. Co.), Chicago.**

Str. S. M. Fischer ... Capt. Fred Johnson ... Engr. S. West.
 " J. C. Ames ... " W. H. Welcher ... " B. Rasch.
 Schr. Transport No. 1 ... " M. Emerson.
 " Transport No. 2 ... " W. Chambers.

MACLAREN, S. R., Toledo, O.

Str. S. C. Baldwin ... Capt. Jas. Maddigan ... Engr. Henry Bayton.
 Schr. A. A. Carpenter ... " Jno. Madden.
 " Myron Butman ... " Jno. Bell.

LAKE SHORE SAW MILL & LUMBER CO., Cleveland.

Str. E. A. Shores ... Capt. L. E. King ... Engr. C. O. King.
 Schr. Kingfisher ... " F. Forbes.
 " Donaldson ... " Hannah.

HART STEAMBOAT LINE, Green Bay, Wis.

Str. H. A. Hart ... Capt. C. B. Hart ... Engr. Chas. Dennis.
 " E. C. Hart ... " E. W. Hart ... " Geo. Coulter.
 " F. C. Hart ... " Jos. Corrigan ... " J. Schram.

LAKE ERIE TRANSPORTATION CO., O. W. Upson, Mgr., Cleveland.

Str. Wm. S. Mack ... Capt. Henry Peterson ... Engr. Wm. Young.
 " P. P. Pratt ... " Geo. W. Pierce ... " W. Toney.
 Schr. Athens ... " Geo. Mackie.

VANCE & CO., DAVID.**Managing vessels of Inter Ocean Transit Co., Milwaukee.**

Str. Maryland ... Capt. J. E. Yax ... Engr. M. Conley.
 " Manchester ... " Tim Kelley ... " Jas. Grant.

MICHIGAN WRECKING & SALVAGE CO., Detroit.

Str. Ogema ... Capt. Martin O'Toole ... Engr.
 " H. W. Johnson ... "
 Schr. M. I. Wilcox ... " Chas. Woods.

DULUTH & ATLANTIC TRANSPORTATION CO.,**(Geo. M. Black, Auditor, Detroit.) W. C. Richardson, Mgr., Cleveland.**

Str. Iron King ... Capt. T. J. Brady ... Engr.
 Schr. Iron Queen ... " T. Fitzsimmons.

RICHARDSON, W. C., Cleveland.**(Representing estate of Valentine Fries of Milan, O.)**

Str. Wm. Edwards ... Capt. Jas. La Framboise ... Engr. Moses Blondin.
 Schr. Golden Age ... " D. H. Stalker.

VANCE & CO., DAVID.**Managing vessels of Milwaukee Steamship Co., Milwaukee.**

Str. F. L. Vance ... Capt. E. B. Marquette ... Engr.
 " R. P. Flower ... " F. W. Van Patten ... " Dan'l Darcy.

PICKANDS, MATHER & CO.,**Managers for Interlake Co., Cleveland.**

Str. Victory ... Capt. G. B. Mallory ... Engr. A. Arnold.
 Schr. Constitution ... " Wm. Holly.

PICKANDS, MATHER & CO.,**Managers for Huron Barge Co., Cleveland.**

Str. Pathfinder ... Capt. D. H. Mallory ... Engr. C. H. Heisner.

PICKANDS, MATHER & CO.,**Managers for Boston Coal Dock & Wharf Co., Cleveland.**

Str. Appamatux ... Capt. Hugh Stevenson ... Engr. H. A. Woods.
 Schr. Santiago ... " Chas. Hebner.

RICHARDSON, W. C., Manager Jackson Transit Co., Cleveland.

Str. Samuel Mitchell ... Capt. J. H. Babbitt ... Engr. A. C. Bowen.
 Schr. Chickamauga ... " H. W. Phillips.

RICHARDSON TRANS. CO., W. C. Richardson, Mgr., Cleveland.

Str. W. C. Richardson ... Capt. T. Wilford ... Engr. Jas. Falconer.
 " Roumania ... " C. C. Mason ... " L. Regan.

RALPH & CO., P. J., Detroit.

Str. S. J. Macy ... Capt. M. W. Gotham ... Engr. W. F. Gregory.
 Schr. Mabel Wilson ... " J. E. Gotham.

LAKE ONTARIO & BAY OF QUINTE STEAMBOAT CO.,**Kingston, Ont.**

Str. Caspian ... Capt. Wm. Bloomfield ... Engr. G. Boyd.
 " North King ... " Jno. Jarrell ... " O. J. Hickey.

RED STAR LINE, 202 Main St., Buffalo.

Str. Robert Mills ... Capt. F. A. West ... Engr. Wm. Skelton, Jr.
 " Cuba ... " Robt. Young ... " E. Furey.

SQUIRES, J. W., Marine City, Mich.

Str. Jim Sheriffs ... Capt. Saml. Olson ... Engr. Wm. P. Eals.
 Schr. Jas. Mowatt ... " E. P. Titus.

RECOR, E. C., St. Clair, Mich.

New Str., not named. Capt. Sylvester Moore ... Engr. C. Schunk.
 Schr. Golden Rule ... " C. W. Recor.

HAHN, J. N., Cleveland.

Str. Jas. H. Shrigley ... Capt. Engr. Jno. Skelly.
 Schr. Shawnee ... " A. W. Palmateer.

OSBORNE, F. M., Perry-Payne Bldg., Cleveland.

Str. John W. Moore ... Capt. E. Detlefs ... Engr. A. G. Bohland.
 " Louisiana ... " Truman Moore ... " A. Ward.

SPENCE BROS., Cleveland.

Str. H. E. Runnels ... Capt. Geo. McLeod ... Engr. Thos. McLaughlin.
 Schr. Celtic ... " Jeffries.

MIDLAND NAVIGATION CO., Midland, Ont.

Str. Midland Queen ... Capt. W. H. Featherstonbaugh ... Engr. E. Abbey.

KINSMAN TRANSIT CO., H. Steinbrenner, Mgr., Cleveland.

Str. Henry Steinbrenner ... Capt. Jos. Lampoh ... Engr. W. C. Miller.

WALLACE & CUNNINGHAM TRANSIT CO.,**Jas. I. Wallace, Pres., Detroit.**

Str. W. B. Morley ... Capt. Jno. McAlpine ... Engr. Jno. Volker.

CASE, F. B., Norwalk, O.

Str. Case ... Capt. J. D. Peterson ... Engr. Fitzgerald.

NIPIGON TRANSIT CO., Grosse Point, Mich.

Str. J. C. Ford ... Capt. N. L. Morrison ... Engr. A. Manion.

GREEN BAY VESSEL CO., Green Bay, Wis.

Str. Orion ... Capt. G. H. Scott ... Engr. E. M. Murdock.

LANGELL, SIMON, St. Clair, Mich.

Str. Alfred Mitchell ... Capt. H. R. Beall ... Engr. P. J. Merrill.

VANCE & CO., DAVID.**Managing vessels of Wisconsin Steamship Co., Milwaukee.**

Str. F. Schlesinger ... Capt. D. P. Craine ... Engr. A. R. Fortier.

SLYFIELD, A. B., Port Huron, Mich.

Str. T. D. Stimson ... Capt. A. B. Slyfield ... Engr. Jos. Schnell.

CORNING, GURDON, Saginaw, E. S., Mich.

Schr. Our Son ... Capt. Geo. W. Ryan.

HAYNES, J. F., Port Huron, Mich.

Schr. Charlie Crawford ... Capt. Allen Curtis.

IONIA TRANS. CO., F. M. Thompson, Mgr., Detroit.

Str. Ionia ... Capt. Alex. Craigie ... Engr. Thos. Purvis.

POTTER, TEARE & CO., Cleveland.

Str. Mary A. McGregor ... Capt. Henry Brock ... Engr. Wm. Griffith.

SHOAL WATER TRANS. CO., Mt. Clemens, Mich.

Str. Norwalk ... Capt. Frank Goodrow ... Engr. Joe Bedor.

BIELMAN, C. F., Detroit.

Str. Florence B. ... Capt. Edward Baker ... Engr. Jos. Rousseau.

WATSON, HENRY W., Buffalo.

Str. Inter Ocean ... Capt. Peter Wex ... Engr. Thos. Ingram.

OWEN TRANS CO., J. EMORY, (R. T. Gray, Mgr.) Detroit.

Str. John Owen ... Capt. E. F. Thorp ... Engr. S. L. Phillips.

CORRIGAN, JOHN, Cleveland.

Str. Aurania ... Capt. F. B. Cody ... Engr. Wm. Bannerman.

Work is progressing rapidly on the various craft under construction at the New England Co.'s ship yard, Bath, Me. The steamer for the Eastern Steamship Co. will be ready to go overboard about May 1. The keel for a four-masted schooner for Edwin P. Boggs of Boston is laid. The three-masted schooner for Capt. McKeown of Boothbay, Me., is in frame and the keel for the three-masted schooner for Capt. F. W. Benedict of New Haven, Conn., is stretched. A contract was recently secured by the New England Co. for two 1,000-ton barges for the Baltimore & Boston Barge Co. The craft will measure 225 ft. over all, 35 ft. beam and 18 ft. depth. They are to be started shortly and are to be finished by the last of August.

Special harbor charts, covering all harbors of importance throughout the great lakes, have been issued within the past year by the lake survey officials. The latest is Milwaukee harbor. Prices are in all cases very low. The Review carries them in stock.

James Hyde has been appointed engineer of the Duluth & Atlantic Transportation Co.'s steamer Iron King.

SHIP YARD OF ABRAM SMITH & SON.

A couple of views of the ship building and repair works of Abram Smith & Son at Algonac, Mich., on the St. Clair river, are presented on this page. This is one of the few yards on the lakes that now follow wooden ship building, both in new work and repairs. Its experience during the past year would seem to indicate that there is still a great deal of work to be had in the rebuilding of wooden vessels. With a location well suited to this class of work, having numerous dredged slips for the moving of vessels safe from ice, freshets, etc., this firm has been obliged during the



WORKS OF ABRAM SMITH & SON, ALGONAC, MICH.

past winter to turn away orders that would have resulted in almost doubling their business. There has been some talk of late of putting tools in at these works for repairs to steel vessels and possibly for the building of steel vessels, but the matter has not taken definite shape as yet.

THE 'LONGSHOREMAN.

Mr. Ralph Bergengren has contributed to the Boston Evening Transcript the following excellent description of the 'longshoreman as he is known on the coast:

However much you may have known about the other participants in our recent big strike I'll wager you knew little enough about the 'longshoreman. No wonder; he is hidden away behind a tall fence. Literally, I mean. Beginning just beyond the Charlestown bridge, the whole water front of Boston conceals itself for a space of several blocks by hideous high fences, joining the walls of towering, dreary looking buildings, and punctured by widely separated gateways through which you get confusing glimpses of wharves, hogsheds, bales, boxes, cumbersome drays and steaming horses and the spars and painted smokestacks of ocean-going steamships. The fence which separates the real Boston 'longshoreman and his work from the gaze of the general public makes of him too commonly a mere picturesque abstraction rather than a hard-working and necessary, concrete actuality. There are only about 1,000 of him, although the countless rabble of roustabouts, freight-handlers and loafers along Atlantic avenue do their best to share his title. The real thousand—the genuine 'longshoremen—are as varied as any similar number of brawny American workmen. Their distinctive trait is simply this—they live "along shore" in sometimes neat and sometimes dirty but always most lamentably prosaic tenements, and they load and unload the transatlantic steamships. They are Irish, one and all, of sturdy build, about medium height as a rule, with the general look of sailormen, but the shambling stride of landlubbers. They are wild extremists, ready to work forty-eight hours on a stretch or to loaf an equal period. Some of them drink in the same rough and ready fashion; some are sober heads of good straightforward families. The picturesque abstraction lies outrageously in representing the 'longshoremen as inevitably hard drinkers; their faces tell quite another story. Their calling develops strong bodies and often strong characters; when it is mixed with alcohol it thins their number and the 'longshoreman who lives up to his outside reputation is old before forty.

The centering of transatlantic traffic along the Charlestown water front makes Charlestown the natural abiding place of the 'longshoremen, whose daily earnings are in direct proportion to their nearness to the docks. The size of the ocean liners and the character of their cargoes differentiate them from the men who perform 'longshore service for the coasting vessels along the front of Atlantic avenue, and whom the true 'longshoreman rather contemptuously regards as mere freight handlers. As a rule they of Atlantic avenue work by the week instead of by the fraction of an hour—an important distinction, for your true 'longshoreman, like a poet or a special writer, works when he can, and gets paid just what he is able to earn during that happy period. Moreover, it is quite a different game to load an ocean liner, and two hatches of the liner—for the hold is divided according to the number of

deck openings—will more than hold the coaster's entire cargo. The true 'longshoreman is more than a machine for trundling a barrow or rolling a cask; he is, indeed, a most uncommonly able-bodied and able-witted fellow who works in co-operation with machinery and is absolutely familiar with the labyrinthine interior of an ocean steamship. You may ask him hard questions and be pretty sure of an intelligent answer. I have found among the 'longshoremen of Charlestown a complete knowledge of the whole system of Charlestown wharves, of the movements of the ships, of the interior mechanism of grain and coal elevators, and of the general habits and tendencies of their fellow workmen. On the other hand, I have found a dozen stupid in succession along the front of Atlantic avenue, who could not direct me to a wharf within half a block of them.

The first sign of an incoming ocean vessel is the eager gathering of 'longshoremen at the head of the wharf. The gathering includes a scattering of raw recruits; but as a rule the wharf foreman, when he comes to select his gangs, knows the name, the character and the ability of each man in front of him. He selects his gangs in accordance with this knowledge. The system, of course, varies with different foremen, but the process is usually almost patriarchally simple. If the incoming steamer has seven hatches, for example, he will want eight gangs of about seventeen men each—one gang to unload each hatch and the eighth to begin loading, provision for which has already been made aboard ship by emptying one hatch and piling the goods contained in it on deck, ready to be taken by the 'longshoremen to the wharf. Each gang is divided. The first man called by the wharf foreman knows without further question his place at the machinery that lifts cargo out of the hold. He is the winchman. The second knows his position at the hatch, to receive the cargo as it is hoisted to the deck. The five following the hatchman go down the ladders into the hold. The next man called knows that he is to be assistant hatchman, and the others know that their business is to distribute the cargo to various pre-ordained places on the dock. All this, mind you, is distinctly a form of skilled labor. Upon the winchman, for example, depends the hoisting of hundreds of pounds of merchandise at a time, with safety to the men working in the lower hold; these men, in turn, 50 ft. or more below decks, must of necessity work quickly and surely; the hatchman must supply a ever-watchful connection between the lower hold and the workers on the wharf, who in turn must be quick to follow the directions of the receiving clerk if they are to get each item of a miscellaneous cargo to its proper place in the warehouse without interrupting the process of unloading. Steamers, like railroads, move by schedule; no matter how late a steamer comes into port, she must go out again at the appointed hour, wind and weather permitting; and when the 'longshoreman works in a hurry, which is a large part of the time, there are twenty-four hours in his day in good earnest. And there are no holidays in the week.

The 'longshoreman has to know his ship or else he could hardly fit in with the system. Here, for example, is a typical miscellaneous cargo for a not very large ocean steamer: 64,000 bushels of wheat and corn, three cars of flour, five of lumber, ten of provisions, twelve of sundries, one of agricultural machinery, 100 tons of paper, 240 barrels of cider, 450 cattle, to say nothing of local exports of leather, machinery, etc. Suppose you



WORKS OF ABRAM SMITH & SON, ALGONAC, MICH.—View from St. Clair, Mich.

were given a steamship and told to pack these things away in her. A mental comparison between a steamer and a trunk suggests some of the difficulties, but not all of them. For your trunk is not intended to float, and you can pack it without any reference to the way in which it is likely to trim.

The stevedore theoretically packs this overgrown ocean-going trunk in advance and decides just where the 'longshoremen shall place each item of the cargo. He does this on the basis of long experience and a longitudinal plan of the ship, which shows each deck, and the cargo goes in according to weight and material. The wheat, for instance, goes to the lower deck, where, unless the hold is filled to the top, it is covered with

boards and heavier articles placed on top of it. Liquids go best near the bottom. Coffee and flour cannot be put near together lest the flour respond to the stronger nature of its neighbor and come out with a faint aroma of the coffee berry. Meats, of course, must be put far away from the engines, near the refrigerators of the orlop deck, just over the lower hold. The cattle are likely to travel above the orlop deck—a name which curiously suggests the growth of ocean freight, for it is a survival of a time when two decks were the carrying capacity of a steamer, and the upper of these was called by sailors the "all up." The number of these decks varies with the size of the steamer. They are dark and subterranean, or rather subaqueous, and no one but a sailor or 'longshoreman is sufficiently at home in them expeditiously to stow a cargo. The older 'longshoremen were in fact sailors and those of the younger generation have been brought up between decks. Their places literally cannot be effectively supplied by green hands, and they are to the stowing of a ship's cargo exactly what the sailors are to sailing her.

There are not many old men in this disciplined army. The work is not work for any but the able-bodied. Even then, as one of them said to me, "it's the Lord's own wonder how they stand it." Many of them don't stand it, and the survival of the fittest leaves naturally a class of men who are physically reckless and not exactly respecters of persons. You can manage a 'longshoreman if you know how, or if he is good-natured; but if you don't know how and he isn't good-natured, it is wiser to begin learning the art of command with a Sunday-school class and work up. And unless you are a 'longshoreman yourself you will have a tough time working up. Every gang is under its own boss who was once a subordinate. Very few of them ever leave this occupation. Probably also, as with other men who live by fits and starts, they like the gambler's element of uncertainty and the excitement of making up for the time lost by a ship on the inward voyage. There is something of the "euchred God Almighty's storm and bluffed the eternal sea" about it when the big liner, three days late to port, goes out on schedule time on her next sailing day.

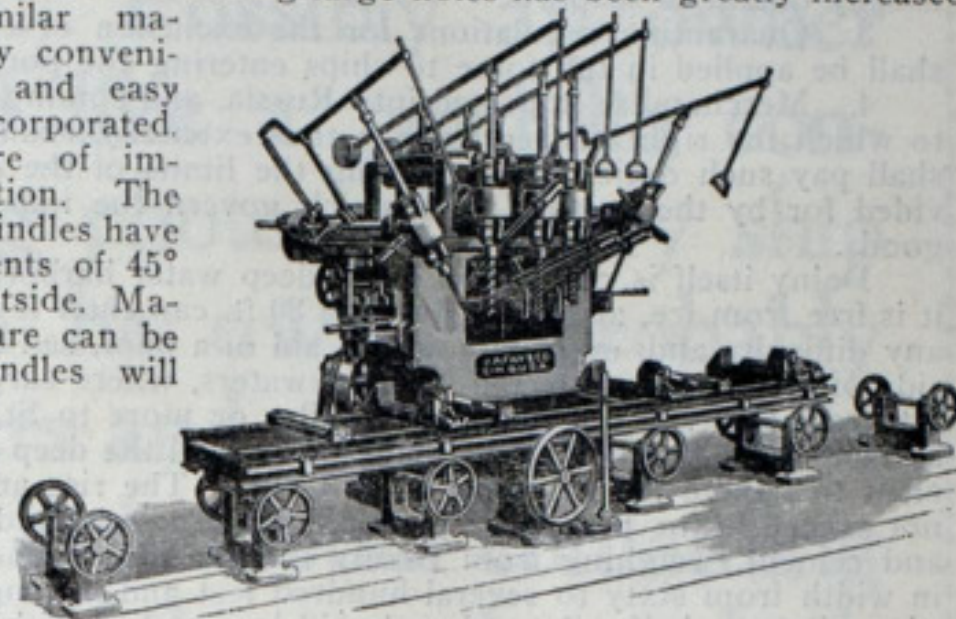
A young 'longshoreman pleasantly exhibited this pride in the work by the sincerity of his regret that he couldn't empty a warehouse for my benefit and then show me how rapidly it would fill up when a big ship came in. "It never is empty," he added—but the imagination could at least partly visualize the picture. Imagine a long building, its dimensions suggesting a great railway station with the light struggling in through a regularly ordered network of beams and rafters overhead and the blue water of the harbor visible through open doors on three sides of you. Rows of freight cars stand waiting for an incoming cargo and the pigeons flutter noisily from rafter to rafter. Otherwise the place is silent and deserted. Imagine this same place, a big steamer moored at one side for a few hours and the cargo beginning to be piled upon the dock. The plan drawn by the stevedore in London and brought over by the ship is being worked backward. The man in charge of the dock knows where every article on the bill

of lading has been stowed away in the newcomer's comprehensive interior, and every 'longshoreman knows his exact place in the human mechanism now bringing it to the light of day again. Suppose a day to have passed and the warehouse is full of merchandise—not crowded, for there is room for several cargoes, but comfortably full; and full also of the cumbersome drays and steaming horses, of the casks, hogsheds, bales and boxes, of freight handlers loading the cars, and 'longshoremen still unloading the vessel. All this without a pause, without a hitch and without disturbing the well accustomed pigeons on the rafters. This is the work of the 'longshoreman, and when you see him standing on a corner, looking so much like a sailor until he walks, it will do no harm to realize that nobody else could do it half so expeditiously.

FIVE-SPINDLE VERTICAL CAR BORER.

An improved machine, especially adapted for heavy boring in ship yards, is shown herewith. It was patented Jan. 30 and Feb. 6, 1900. The capacity of the machine for boring large holes has been greatly increased

over other similar machines, and every convenience for quick and easy work has been incorporated. The spindles are of improved construction. The outside boring spindles have angular adjustments of 45° inside and 60° outside. Material 14 in. square can be bored. The spindles will travel 13 in. and the vertical movement of end spindle frames is 8 in. The outside spindles can be instantly locked at any angle desired. There is no strain, and short bits can be used with facility.



The table is a steel traveling carriage of any length desired, is provided with necessary stops, and has a device for firmly clamping the stock. It has rack and pinion feed under instant control of the operator, and has connections for making fine adjustments. When desired a stationary table 9¼ ft. long, with nine rolls, can be furnished. A supplemental under-boring spindle, especially useful for boring coal car sides, can be furnished, boring independently or at the same time as the upper spindle, and short bits used to advantage. This feature will prove very beneficial to all those who make such cars.

The makers, J. A. Fay & Egan Co. of No. 325 to No. 345 West Front street, Cincinnati, can be addressed relative to further details, cuts or prices.

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NEW RUSSIAN PORT OF DALNY.

In an elaborately illustrated report to the state department Consul Henry B. Miller of New-Chwang describes the progress made by the Russian government in establishing its new Manchuria seaport, Dalny, on the gulf of Pe-Chi-Li. Dalny is the Pacific coast terminus of the Chinese Eastern railway and its connections, the Central Manchurian and the Great Siberian railway, and is the commercial seaport of Russia, created and constructed in accordance with an edict of the emperor of Russia dated July 30, 1899. In this edict the czar defined as follows the conditions on which the new port was to be open to foreign trade:

1. The right to import and export merchandise of every description free of customs duties, is established in the city, in the port, and in the adjacent territory up to a fixed boundary line, which may be changed by the minister of finance.

2. The right of free trade thus established shall not affect the tolls for carriage or for anchorage, or such other taxes of various kinds which usually obtain in seaports.

3. Quarantine regulations for the exclusion of contagious diseases shall be applied in full force to ships entering the port.

4. Merchandise imported into Russia, and coming from the territory to which the right of free trade is thus extended, shall be examined, and shall pay such duties upon entering the limits of the empire as are provided for by the general laws which govern the importation of foreign goods.

Dalny itself is one of the finest deep water harbors of the Pacific, as it is free from ice, and ships drawing 30 ft. can enter it at low tide without any difficulty and, even without the aid of a pilot, sail or steam up alongside of piers, well protected by breakwaters, where cargoes can be loaded into cars that run direct for 6,000 miles or more to St. Petersburg. The surface of the bay comprises many miles, and the deep water area is sufficient to handle the shipping of all China. The rise and fall of tide does not exceed 12 ft. Five large piers are being constructed of blocks of stone and cement, weighing from twenty to fifty tons. These piers will vary in width from sixty to several hundred feet and in length from a quarter of a mile to a half mile, and each will be supplied with numerous railroad tracks and warehouses and elevators, gas, electric lights and water. One of these piers was completed in July, 1901, and another will be ready for use by the end of this year. There is abundance of room in the harbor and sufficient depth of water to provide for any number of piers desired. A breakwater is being constructed across the pier harbors, so that ships can load and unload regardless of weather. Docks for foreign vessels, steam and sail, will extend between these piers and along the shore for 2 miles. Docks, piers and anchorage for the Chinese native craft will be in another portion of the bay, opposite the native city, convenient to the railroad line.

The construction of docks is proceeding well, and two large dredgers, built in Glasgow and laid down at Dalny, at a cost of \$188,900 each, are doing splendid service in deepening and filling the harbor. Two first-class dry docks are also being constructed. One is intended for ordinary ocean steamers and the other is designed to accommodate the largest vessels of commerce or war that float the oceans of the world. The first of these dry docks is in course of active construction, as 1,700 men are daily working for its completion. It is difficult to conceive of a port where the economy of handling cargo will excel that of the harbor of Dalny when it is completed. From the design and execution so far as completed, founded on the splendid features nature presents at this place, it will be practically a perfect harbor.

The port is to be absolutely free, as no custom house is to be established. Even the moderate rates of Chinese customs will not be charged on goods landing or to be exported from here. Tonnage dues, dock charges and wharfage and warehouse charges will all be maintained at the lowest point, with the view to encourage and develop commerce. All these features will be modelled on the methods of Japan. The low priced coolie service, the small labor required to move goods from the great ocean vessels to the cars, the ease of entrance into the harbor at all seasons of the year and the announced policy of low charges will combine to make this the most economical shipping port of the Orient; and the enormous trade which a wise and honest policy of railroad administration is sure to develop will create here one of the greatest commercial points on the Pacific.

The city, according to the plan that is being followed in construction, is to consist first of the administration portion, in which will be railroad shops for making cars, etc.; repair shops, steamship construction and repair shops, port, steamship and railway headquarters and offices, homes of mechanics and general employes, together with parks, hotels, churches, schools, clubs and places for amusements. This portion of the city is being completed at the present time and contains a great area of well constructed streets and substantial brick buildings. Immediately back of this administration city, which is built on a small peninsula, are the godown, warehouse, large hong and general wholesale section. This portion extends to the docks and piers, and, together with the administration and Chinese section, covers the entire water front. Joining this is the retail and general mercantile section, and further off toward the hills and on gradually sloping higher ground that commands a beautiful view of the bay lies the foreign residence section. The Chinese section faces on the bay, and is distinctly separate, with docks and junk shipping adjoining. Electric lights are already in operation, and a complete system of electric tramways is in course of construction. About three miles from the foreign settlement, to the southeast, is an excellent sea beach that is to be arranged for a summer resort. Already an excellent highway is being made to connect it with the town.

There are 23,000 men daily at work in the construction of the port and town, and the total population is about 50,000, mostly Chinese, Japanese, Koreans and Russians. Already something more than \$6,180,000 is said to have been expended in purchasing the plant and constructing the harbor and city, and it is said that it is the intention to expend \$11,845,000 more in completing it, a total cost of \$18,025,000. It is intended that the city shall be free to people of all nations. Land is to be sold at auction to the highest bidders as soon as lots are graded and streets, etc., completed. The sales are expected to begin about April 1, 1902. Many people have already erected buildings, under an arrangement to have the first right to purchase or to have all their improvements paid for by other purchasers.

The city is to be managed by a council to be elected by the ratepayers. Two members of the council must be Russian subjects, and not more than two Chinese or two Japanese can be elected to the council at the same time. The Chinese Eastern railway, which terminates at Dalny, is completed north to Harbin, where it connects with the Central Manchurian railroad. This road is completed east to Vladivostok and west to Kaidalovo, where it connects with the great Siberian railroad, which has heretofore carried its traffic to the head of navigation on the Amoor, thence down this stream to Harbarosk and south by railroad to Vladivostok.

On Nov. 1, 1901, the Central Manchurian and the Chinese Eastern railways are to be open for traffic, and cars will then be able to pass direct from Dalny to St. Petersburg, and train service will be continuous, Lake Baikal being crossed by steamers carrying the trains. The newly appointed Russian minister to Peking has just passed over the route, going from St. Petersburg to Dalny in twenty-one days. As soon as the entire line is completed, it is intended to run fast trains with excellent car service every three or four days. While through rates are not yet established, the chief engineer at Dalny says that the charge from Dalny to St. Petersburg will not exceed \$77.25. The Chinese Eastern Railway Co., under the direction and with the support of the Russian government, is not only building the railroad and the port and town of Dalny, but it is already engaged in the steamship service, and has over twenty steamers in the Chinese service, doing business at Port Arthur and Dalny. This number will be increased, and larger and better vessels added, and as soon as through travel is established the managers intend to run fast boats in connection with their fast trains. They have designed fine passenger boats to leave Dalny an hour after the arrival of the fast trains and steam to Nagasaki, Japan, at the rate of 16 knots an hour. This fast service will not be established for something over a year, but a comfortable steamer is already running to Che-Foo from Dalny.

WIRELESS TELEGRAPHY.

Mr. P. T. McGrath, editor of the Evening Herald, St. John's, Newfoundland, contributes to the Century an article on Marconi's work which the inventor authenticates in a prefatory note. The writer says:

"In one of our many talks at the St. John's station, Mr. Marconi gave me this digest of his conclusions: The wireless agency is most effective over marine areas. The unbroken surface of the ocean enables distances to be obtained and results achieved which can not be approached on land. Over low-lying country two-thirds of the distance can be reached, but over tracts where the usual diversified topographical features are found the potency of the vibrations is reduced to one-half what it is at sea. High hills do not constitute an obstacle, but the ground itself retards the signals. The vibrations seem to reach slightly farther in fog than in fine weather; atmospheric conditions do not seriously affect them; electrical disturbances are their only foe. Mr. Marconi's later experiments appear to indicate that a pole 200 ft. high gives the best results, as the wire suspended from it comes into contact with sufficiently varied atmospheric strata, while at the same time it can be made thick enough to receive a substantial electrical influence from the radiating ether waves which are caught by it. With a balloon or kite elevated to an altitude of 400 ft. or so, the wire must be very slight, and the ceaseless swaying of the upholder also interferes with the reception of definite signals. Strangely enough, a horizontal aerial wire is of no value, gives out no energy for his purposes, and was long ago discarded. Nor is it an advantage, in marine signaling, to set up the pole or kite on a high hill. Proximity to the sea is desirable, and a low-lying spit near the ocean is the best. Another less interesting circumstance is that every piece of ground will not serve for the locating of a station. Some geological formations are perverse; others are responsive. Signaling from one headland, a distance of 200 miles may be reached; from another the range may be only half that. On ships the aerial wire is suspended from the top of the mast, hanging loosely down among the stays and rigging. It is composed of copper and steel, and will stand considerable strain. It enters the operator's room at the deck, and the mechanical features are similar to those of an ordinary telegraph office."

LARGEST ANCHOR EVER FORGED.

The Boston Post says that the largest anchor ever forged has recently been turned out in the forging shop at the Charlestown navy yard. It weighs 16,500 lbs. and the cost of material and construction is nearly \$2,000. Five men worked on it for over a month, hammering, smelting and welding it. This anchor is to form part of the equipment for one of the new battleships that are to be added to the navy. The making of it was first tried as an experiment. It was not certain that an anchor of such size could be forged. Anchors of as great weight have been made of cast steel, and such are used on some ships of the American navy, as well as on British warships. The anchor, which, barring unusual conditions of undertow or violent storm, is sufficient to hold in her moorings the largest battleship afloat, is nearly 15 ft. in length from crown to shackle, and about 9.6 ft. wide from one arm point to the other. The heavy cross bar is also about 15 ft. in length. The palms, or broad flat pieces which are welded to the arm ends, are about 32 in. in width. A specially heavy chain cable, larger than any hitherto made, is required to hold this anchor. The links of this cable, each one of which weighs, when complete, over 60 lbs., require a gang of men to pound and weld and smelt for a half hour in the joining of each one. Three hundred and sixty fathoms of this immense chain will be required for each anchor. The officials of the equipment department in the navy yard are especially busy now. They say that in the forge shop they have anchors enough now ordered to fill all their time for the next four years. The steam hammer which is used in forging the anchors gives a stroke of eleven tons. The officers hope soon to have one giving a stroke of twenty-five tons. With that, they claim, they can get on much faster.

The Herreshoff Manufacturing Co., Bristol, R. I., launched the steam yacht Quickstep for Frederick Grinnell of New Bedford, Mass., a few days ago. She is 125 ft. over all, 100 ft. on the water line, 15 ft. beam, and has a draught of 7 ft.

For the first time in many years Vinalhaven, Me., is to be the scene of ship building. Timber is being received there daily for the construction of a 400-ton three-masted schooner for Capt. Webster at Pleasant river.

PRESERVO, A SOLUTION TO BE APPLIED TO COTTON DUCK.

In this issue of the Review a Port Huron concern, the Robeson Chemical Co., advertises quite extensively a preparation known as "Preservo," which has been tried during two or three years past on lake vessels as a covering for canvas. It is applied with a brush, just as paint would be applied. Several of the best known captains on the lakes are very earnest in their praise of it, especially when used on hatch covers. Capt. M. Mulholland of the steamer Alva says in sending the company an order for thirty-five gallons: "It is perfect and does all you claim for it. I have tested it thoroughly."

"The Belgian covers on my boat," says Capt. John McArthur of the steamer Italia, "were leaking badly. As the material was expensive, it would have been quite a loss to throw the covers away and buy new ones. I painted them (one coat) with your water and weather proof solution and they are as good as new."

The solution dries in a few hours and contains no oils, grease or other substances that would destroy the fiber. It is claimed for it that it will not scale, crack, freeze or rot. It is put up in five-gallon wooden buckets. The manufacturers say that since preparations for the opening of lake navigation have been under way they are hard pressed to keep up with orders. They have a New York office at 1441 Broadway.

DECLINE OF BRITISH SHIPPING.

Lord Charles Beresford, at a dinner of the Institute of Naval Architects in London last week, discoursed the decline in British shipping. Ten years ago, he said, the British India Co. had the largest tonnage; the Messageries Maritimes came next and the Peninsular & Oriental third. Today the Hamburg-American line leads with the North German Lloyds second, and Elder-Dempster, a British line, third. Ten years ago the British mercantile marine formed 80 per cent of the shipping of the world, but today it is only 69 per cent. Proper measures should be taken, said Lord Charles, for the protection of England's mercantile marine. He appealed to the nation to see that the naval reserve was placed on a more satisfactory footing, and then electrified his audience by declaring that he should go to different towns in the country and explain the condition of affairs, even if the authorities should court-martial him out of the naval service.

Rear Admiral R. B. Bradford, chief of the navy bureau of equipment, is at present making a tour of the West Indies for the purpose of selecting coaling stations. He is making the tour on the dispatch boat Dolphin. Four coaling stations will be selected in Cuba, probably at Havana, Nipe bay, Guantanamo and Cienfuegos.

From present indications the New York assembly will defeat the bill for the improvement of the Erie canal which was passed by the New York senate.

COMPAGNIE GÉNÉRALE TRANSATLANTIQUE**FRENCH LINE—UNITED STATES AND EUROPEAN MAIL ROUTE.**

New York to Havre-Paris in less than one week.
Steamers sail from New York every Thursday, at 10 a. m.

Company's own vestibuled train from Havre to Paris in four hours.

FLEET 70 STEAMERS.

In New York service the following gigantic Twin Screw Steamers:

"LA LORRAINE" (new)	Twin Screw	15,000 tons	22,000 H.P.
"LA SAVOIE" (new)	"	15,000 "	22,000 "
"LA TOURAINE" (modern)	"	10,000 "	12,000 "
"L'AQUITAINE" (modern)	"	10,000 "	16,000 "

Naval officers command above steamers, insuring the same strict discipline as on a man-of-war. These ships all have double bottoms and water-tight compartments, and prescribed routes are taken to avoid fogs. The above steamers contain every modern twentieth century equipment for safety, most luxurious accommodations, and the cuisine is famous. The favorite route of the elite of both continents. For rates, plans and other particulars apply to

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OWNERS, Masters and Engineers of Lake Vessels may be interested in securing photographs of their ships. Possibly an owner would like a portfolio containing photos of every ship which he owns; probably masters and engineers would like a little album containing photos of the vessels in which they have sailed—in other words a photographic story of their life work.



The Marine Review is prepared to furnish single prints of vessels or portfolios of fleets. It has a pretty thorough list of active vessels, of docks, elevators, coal and ore handling machinery, etc., some the product of its own camera and others secured through established photographic agencies.




The price at which we furnish photographs is very low.



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"PRESERVO" WILL NOT CRACK, SCALE, FREEZE OR STICK—SEE PAGE 8.

TRADE NOTES.

Capt. S. Bickford has been appointed general agent of the Algoma Central Steamship line. He was connected with the White Star line for about fifteen years.

The Browning Engineering Co. of Cleveland has received a contract from the National Bridge Co., a new Pittsburgh organization, for a traveling crane for its prospective plant at South Monaca, Pa.

The Bourne-Fuller Co. (iron, steel and pig iron) of Cleveland announces the removal of general offices on April 1 to the eighth floor of the Hickox building, corner of Euclid avenue and Erie streets.

The name of the Wellman-Seaver Engineering Co. of Cleveland will be changed in a few days to that of the Wellman-Seaver-Morgan Engineering Co., thus giving recognition to Mr. Thomas R. Morgan, the secretary of the company. Mr. Morgan will also be the works manager.

The Admiral Anchor Co., Chester, Pa., has received an order for thirty-nine of the Admiral type of stockless anchors for use on steamships of the great lakes. This order alone includes a weight of over ninety tons of anchors. There are eighteen 4,000-lb. anchors, fifteen 5,000-lb. anchors and six 6,000-lb. anchors in the order. The Admiral Anchor Co. has orders on its books for about eighty anchors, weighing in the aggregate about 200 tons. Among the notable orders is one for the great anchors for the ships building at New London, Conn., for the Great Northern Steamship Co. The anchors are made of the finest grade of open-hearth steel by the Seaboard Steel Casting Co. of Chester, Pa.

In a circular dealing with Wilford's waterproof cloth, for which he is agent in the United States and Canada, Edward A. Bunker of No. 20 Broad street, New York, refers to the following concerns that are using the material: Red Star line, American line, Southern Pacific Co., Murray & Co., Chicago, Union Pacific Railroad Co., St. Louis & San Francisco railroad, A. W. Hepburn, Picton, Ont.; Standard Oil Co. (on lighters); Union Iron Works, San Francisco; J. C. Goss & Co., sail makers, Detroit; the Sunde & Erland Co., Seattle; John Mair & Son, sail makers, Philadelphia; Howard H. Baker & Co., sail makers, Buffalo; and George B. Carpenter & Co., sail makers, Chicago. The claim made for this cloth is that it is impenetrable by water, salt or fresh; that it is soft, light, strong and durable, will not crack like cotton cloth and has none of the objections that are found in cloth treated with paraffine, oil or paint. It is very light in weight and still said to be water repellant and to have nearly double the strength of cotton.

The Marine Iron Works, station A, Chicago, have just issued a new 48-page catalogue descriptive of their product, which they will send free on receipt of request. A separate pamphlet issued by the same company, devoted especially to "River Navigation" (shallow water stern wheel boats), will also be included if asked for.

Air Pump and Hoisting Engine For Sale.

One air pump 31 in. diameter, 12 in. stroke, arranged for direct connection; in good condition, taken from steamer Manitou, to be replaced by a larger one. Also one hoisting engine, 12 in. cylinder, made by Chas. Elmes; never been used. Can be seen at Chicago Ship Building Co.'s works, South Chicago. Inquire of Manitou Steamship Co., Chicago. April 24.

Freight and Passenger Steamer Wanted.

Wanted—To purchase or lease a freight and passenger steamer of about 1,000 to 1,200 tons capacity on 14 ft. draught of water. James Allen, 394 Lafayette Place, Milwaukee, Wis. tf.

Elevator and Barges For Sale.

At Prescott, Ont., on St. Lawrence river, elevator of one million bushels capacity, together with fleet of eight steel barges and steam tug. Will be sold by public auction under direction of the court at Prescott, on April 3, at 11:30 a. m.

Full particulars on application to Messrs. MacCracken, Henderson & McDougal, solicitors, Ottawa; Messrs. Leitch, Pringle & Cameron, solicitors, Cornwall; or Wm. Dunn & Co., 47 Board of Trade, Chicago, Illinois. March 27.

Engine, Boilers, etc., For Sale Cheap.

Two Scotch boilers 11x12, 160 lbs. steam. Triple-expansion engine 20, 30 and 54 in. with 40 in. stroke. Shaft, wheel, anchors, chain, etc., from wrecked steamer Fedora. Thoroughly overhauled. Write for particulars. F. L. Gilbert, 301 Torrey Bldg., Duluth, Minn. March 27.

Steamer I. M. Weston For Sale.

Length, 96.5 ft.; breadth, 18 ft.; depth, 7.6 ft.; 95 tons. In first-class condition. E. J. Glackin, 363 So. Morgan street, Chicago. tf

U. S. Engineer office, 428 Custom House, St. Louis, Mo., March 15, 1902. Sealed proposals, in duplicate, for building and installing two refrigerating plants will be received here until 12 noon, April 14, 1902, and then publicly opened. Information furnished on application. Thos. L. Casey, Major, Engrs. April 10.

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Year.	Australien	Polynésien	Armand Béhic	Ville de la Ciotat	Ernest Simons	Chili	Cordillère	Laos	Indus	Tonkin	Annam	Atlantique
1890.....	67,728	2,460										
1891.....	68,247	68,331	204									
1892.....	68,247	68,403	69,822	23,259								
1893.....	68,379	68,343	68,286	68,247								
1894.....	68,439	68,367	68,574	68,439	37,701							
1895.....	68,673	68,766	68,739	68,808	40,887	28,713						
1896.....	69,534	92,718	69,696	69,549	62,205	63,153	40,716					
1897.....	68,250	69,606	92,736	69,555	62,235	76,110	63,357	43,146				
1898.....	70,938	69,534	69,552	69,597	62,526	63,240	63,240	62,553	63,954	22,707		
1899.....	69,534	69,615	67,431	90,405	60,246	62,778	62,868	52,344	54,855	44,007	22,884	
1900.....	69,534	67,494	69,744	69,564	61,719	62,382	62,502	51,471	53,373	62,016	63,066	52,140
1901.....	44,220	69,627	69,594	66,948	51,057	62,460	62,490	61,743	62,688	43,866	62,466	63,126
Total.....	801,723	783,264	714,378	664,371	438,576	418,836	355,173	271,257	234,870	172,596	148,416	115,266

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